

## Workshop Manual OCTAVIA II 2004 ➤

1.9/77 kW TDI PD Engine

|           |     |     |     |     |  |  |  |  |  |
|-----------|-----|-----|-----|-----|--|--|--|--|--|
| Engine ID | BJB | BKC | BXE | BLS |  |  |  |  |  |
|-----------|-----|-----|-----|-----|--|--|--|--|--|

Edition 02.04

# ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## List of Workshop Manual Repair Groups

# ŠKODA

### Repair Group

- 00 - Technical data
- 01 - Self-diagnosis
- 10 - Removing and installing engine
- 13 - Crankgear
- 15 - Cylinder Head, Valve Gear
- 17 - Lubrication
- 19 - Cooling
- 20 - Fuel Supply
- 21 - Turbocharging
- 23 - Fuel Formation, Injection
- 26 - Exhaust System
- 28 - Glow Plug System



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.



## Contents

|                                                                                              |           |
|----------------------------------------------------------------------------------------------|-----------|
| <b>00 - Technical data</b>                                                                   | <b>1</b>  |
| <b>1 Technical data</b>                                                                      | <b>1</b>  |
| 1.1 Engine number                                                                            | 1         |
| <b>01 - Self-diagnosis</b>                                                                   | <b>2</b>  |
| <b>1 Self diagnosis, safety measures, cleanliness regulations and directions</b>             | <b>2</b>  |
| 1.1 Self-diagnosis                                                                           | 2         |
| 1.2 Supplementary instructions and assembly work on vehicles with an air conditioning system | 2         |
| 1.3 Safety precautions when working on the fuel supply system                                | 3         |
| 1.4 Safety precautions when working on the fuel supply of the diesel direct injection system | 3         |
| 1.5 Regulations concerning cleanliness when working on the fuel supply/fuel injection system | 4         |
| 1.6 Regulations concerning cleanliness when working on the exhaust gas turbocharger          | 4         |
| 1.7 General instructions for charge air system                                               | 5         |
| <b>10 - Removing and installing engine</b>                                                   | <b>7</b>  |
| <b>1 Removing and installing engine</b>                                                      | <b>7</b>  |
| 1.1 Removing                                                                                 | 7         |
| 1.2 Install                                                                                  | 13        |
| 1.3 Inspecting and adjusting the assembly bracket                                            | 19        |
| <b>13 - Crankgear</b>                                                                        | <b>21</b> |
| <b>1 Removing and installing a V-ribbed belt and a timing belt</b>                           | <b>21</b> |
| 1.1 Removing and installing V-ribbed belt                                                    | 21        |
| 1.2 Removing and installing toothed belt                                                     | 24        |
| <b>2 Removing and installing sealing flange and flywheel</b>                                 | <b>35</b> |
| 2.1 Replacing crankshaft seal on belt pulley side                                            | 36        |
| 2.2 Removing and installing the sealing flange on the belt pulley side                       | 37        |
| 2.3 Replace sealing flange on the gearbox side                                               | 39        |
| 2.4 Removing and installing the two-mass flywheel                                            | 45        |
| <b>3 Crankshaft, Piston and Conrod</b>                                                       | <b>47</b> |
| 3.1 Removing and installing crankshaft                                                       | 47        |
| 3.2 Replace needle bearing for crankshaft                                                    | 47        |
| 3.3 Disassembling and assembling piston and conrod                                           | 48        |
| 3.4 Checking piston projection in TDC                                                        | 52        |
| 3.5 Separate new conrod                                                                      | 53        |
| <b>15 - Cylinder Head, Valve Gear</b>                                                        | <b>54</b> |
| <b>1 Removing and installing cylinder head</b>                                               | <b>54</b> |
| 1.1 Summary of components                                                                    | 54        |
| 1.2 removing and installing cylinder head cover                                              | 59        |
| 1.3 Removing and installing cylinder head                                                    | 61        |
| 1.4 Testing the compression                                                                  | 70        |
| <b>2 Repairing valve gear</b>                                                                | <b>72</b> |
| 2.1 Checking the axial play of the camshaft                                                  | 73        |
| 2.2 Replacing camshaft gasket ring                                                           | 74        |
| 2.3 Removing and installing camshaft                                                         | 76        |
| 2.4 Testing hydraulic bucket tappets                                                         | 79        |
| 2.5 Replacing valve stem seals                                                               | 80        |
| 2.6 Valve dimensions                                                                         | 82        |
| 2.7 Inspect valve guides                                                                     | 82        |



|           |                                                                                                      |            |
|-----------|------------------------------------------------------------------------------------------------------|------------|
| 2.8       | Reworking valve seats                                                                                | 82         |
| <b>17</b> | <b>- Lubrication</b>                                                                                 | <b>87</b>  |
| 1         | Removing and installing parts of the lubrication system                                              | 87         |
| 1.1       | Overview of the filter holder                                                                        | 89         |
| 1.2       | Removing and installing oil pan                                                                      | 90         |
| 1.3       | Removing and installing oil pump                                                                     | 92         |
| 1.4       | Testing oil pressure and oil pressure switch                                                         | 92         |
| <b>19</b> | <b>- Cooling</b>                                                                                     | <b>95</b>  |
| 1         | Removing and installing parts of the cooling system                                                  | 95         |
| 1.1       | Parts of the cooling system fitted to body                                                           | 95         |
| 1.2       | Parts of cooling system engine side                                                                  | 98         |
| 1.3       | Connection diagram for coolant hoses                                                                 | 103        |
| 1.4       | Draining and filling up coolant                                                                      | 106        |
| 1.5       | Removing and installing coolant pump                                                                 | 109        |
| 1.6       | Removing and installing coolant regulator                                                            | 110        |
| 1.7       | Removing and installing radiator                                                                     | 112        |
| 1.8       | Removing and installing fan shroud for radiator fan V7 and V177                                      | 113        |
| 1.9       | Checking the coolant system for tightness                                                            | 114        |
| <b>20</b> | <b>- Fuel Supply</b>                                                                                 | <b>115</b> |
| 1         | Removing and installing parts of the fuel supply system                                              | 115        |
| 1.1       | Fuel tank with attached parts                                                                        | 115        |
| 1.2       | Fuel tank with component parts - four-wheel drive vehicles                                           | 117        |
| 1.3       | Summary of components of fuel filter                                                                 | 119        |
| 1.4       | Extract fuel from the fuel tank                                                                      | 120        |
| 1.5       | Removing and installing fuel cooler                                                                  | 122        |
| 1.6       | Removing and installing the fuel tank                                                                | 122        |
| 1.7       | Removing and installing the fuel tank for four-wheel drive vehicles                                  | 123        |
| 1.8       | Check the fuel delivery unit                                                                         | 125        |
| 1.9       | Remove and install the fuel delivery unit for vehicles with front-wheel drive                        | 126        |
| 1.10      | Removing and installing the fuel delivery unit on four-wheel drive vehicles                          | 128        |
| 1.11      | Removing and installing the fuel gauge sender G                                                      | 133        |
| 1.12      | Removing and installing fuel gauge sender 2 G169 for four-wheel drive vehicles                       | 134        |
| 1.13      | Removing and installing the suction jet pump for four-wheel drive vehicles                           | 136        |
| 1.14      | Removing and installing the tandem pump                                                              | 136        |
| 1.15      | Inspecting a tandem pump                                                                             | 138        |
| 2         | Accelerator control                                                                                  | 141        |
| 2.1       | Accelerator pedal module - Summary of components                                                     | 141        |
| 2.2       | Removing and installing accelerator pedal module                                                     | 141        |
| <b>21</b> | <b>- Turbocharging</b>                                                                               | <b>143</b> |
| 1         | Charge-air system with exhaust gas turbocharger - Part 1                                             | 143        |
| 1.1       | Connection diagram for vacuum hoses for engine with identification characters BJB, BKC, BXE          | 143        |
| 1.2       | Connection diagram for vacuum hoses for engine with identification characters BLS                    | 146        |
| 1.3       | Inspect vacuum setting element and tension rods for charge pressure control                          | 147        |
| 2         | Charge-air system with exhaust gas turbocharger - Part 2                                             | 149        |
| 2.1       | Exhaust turbocharger - Summary of components                                                         | 149        |
| 2.2       | Removing and installing exhaust turbocharger for engine with identification characters BJB, BKC, BXE | 152        |
| 2.3       | Removing and installing exhaust turbocharger for engine with identification characters BLS           | 155        |
| 2.4       | Removing and installing parts of the charge air cooling                                              | 157        |
| 2.5       | Removing and installing charge air cooler                                                            | 159        |



|           |                                                                                                                       |            |
|-----------|-----------------------------------------------------------------------------------------------------------------------|------------|
| 2.6       | Hose connections                                                                                                      | 161        |
| 2.7       | Check charge-air system for tightness                                                                                 | 162        |
| <b>23</b> | <b>Fuel Formation, Injection</b>                                                                                      | <b>164</b> |
| <b>1</b>  | <b>Repairing a diesel direct injection system</b>                                                                     | <b>164</b> |
| 1.1       | Overview of fitting locations                                                                                         | 165        |
| 1.2       | Intake manifold - Summary of components                                                                               | 171        |
| 1.3       | Removing and installing air filter                                                                                    | 175        |
| 1.4       | Repairing the unit injectors                                                                                          | 176        |
| 1.5       | Removing and installing O-rings for unit injector                                                                     | 176        |
| 1.6       | Removing and installing the unit injector                                                                             | 178        |
| 1.7       | Removing and installing engine speed sender G28                                                                       | 181        |
| <b>2</b>  | <b>Engine control unit</b>                                                                                            | <b>183</b> |
| 2.1       | Removing and installing engine control unit                                                                           | 183        |
| <b>26</b> | <b>Exhaust System</b>                                                                                                 | <b>185</b> |
| <b>1</b>  | <b>Removing and installing parts of the exhaust system</b>                                                            | <b>185</b> |
| 1.1       | Summary of components for engine with identification characters BJB, BKC, BXE with front-wheel drive                  | 185        |
| 1.2       | Summary of components for engine with identification characters BLS with front-wheel drive                            | 186        |
| 1.3       | Summary of components for engine with identification characters BKC, BXE for four-wheel drive vehicles                | 188        |
| 1.4       | Summary of components for engine with identification characters BLS for four-wheel drive vehicles                     | 189        |
| 1.5       | Removing and installing front exhaust pipe for four-wheel drive vehicles                                              | 190        |
| 1.6       | Removing and installing front exhaust pipe with diesel particle filter                                                | 191        |
| 1.7       | Replacing middle or rear silencer                                                                                     | 194        |
| 1.8       | Aligning exhaust system free of stress                                                                                | 195        |
| 1.9       | Checking the exhaust system for leaks                                                                                 | 196        |
| <b>2</b>  | <b>Exhaust gas recirculation system</b>                                                                               | <b>197</b> |
| 2.1       | Summary of components of cooling of exhaust gas recirculation system                                                  | 197        |
| 2.2       | Removing and installing exhaust gas recirculation radiator for engine with engine identification characters BLS       | 200        |
| 2.3       | Test mechanical exhaust gas recirculation valve for engine with engine identification characters BJB, BKC, BXE        | 202        |
| 2.4       | Check shift flap of exhaust gas recirculation radiator for engine with engine identification characters BJB, BKC, BXE | 202        |
| <b>28</b> | <b>Glow Plug System</b>                                                                                               | <b>204</b> |
| <b>1</b>  | <b>Glow Plug System</b>                                                                                               | <b>204</b> |
| 1.1       | Removing and installing metal glow plugs                                                                              | 204        |
| 1.2       | Inspecting metal glow plugs                                                                                           | 204        |



# ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 00 – Technical data

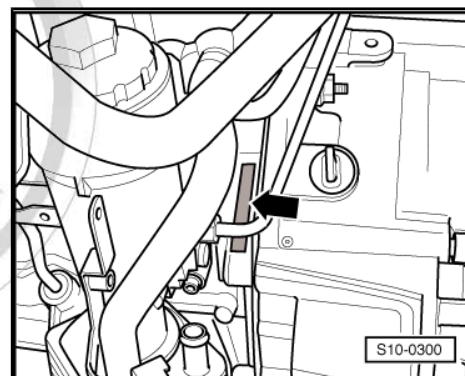
### 1 Technical data

#### 1.1 Engine number

The engine number ("engine code" and "serial number") is located at the front at the joint separating engine/gearbox.

In addition, a sticker with the "engine identification characters" and "serial number" is affixed to the timing belt guard.

The engine identification characters are also indicated on the vehicle data stickers.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

#### 1.1.1 Engine characteristics

| Engine identification characters          | BJB      | BKC           | BXE      | BLS      |
|-------------------------------------------|----------|---------------|----------|----------|
| Manufactured                              | 02.04 ?  | 08.04 ? 03.06 | 02.06 ?  | 05.06 ?  |
| Emission levels in accordance with        | EU-3     | EU-4          | EU-4     | EU-4     |
| Displacement                              | 1,896    | 1,896         | 1,896    | 1,896    |
| Power kW at rpm                           | 77/4000  | 77/4000       | 77/4000  | 77/4000  |
| Torque Nm at rpm                          | 250/1900 | 250/1900      | 250/1900 | 250/1900 |
| Bore Ø mm                                 | 79,5     | 79,5          | 79,5     | 79,5     |
| Stroke mm                                 | 95,5     | 95,5          | 95,5     | 95,5     |
| Number of cylinders / valves per cylinder | 4 / 2    | 4 / 2         | 4 / 2    | 4 / 2    |
| Compression                               | 19,0 : 1 | 19,0 : 1      | 19,0 : 1 | 19,0 : 1 |
| Firing order                              | 1-3-4-2  | 1-3-4-2       | 1-3-4-2  | 1-3-4-2  |
| Self-diagnosis                            | yes      | yes           | yes      | yes      |
| Catalytic converter                       | yes      | yes           | yes      | yes      |
| Exhaust gas recirculation                 | yes      | yes           | yes      | yes      |
| Cooling of exhaust gas recirculation      | no       | yes           | yes      | yes      |
| Turbocharging                             | yes      | yes           | yes      | yes      |
| Charge air cooler                         | yes      | yes           | yes      | yes      |
| Diesel particle filter                    | no       | no            | no       | yes      |



## 01 – Self-diagnosis

### 1 Self diagnosis, safety measures, cleanliness regulations and directions

#### 1.1 Self-diagnosis

This repair group is no longer applicable.

For this use "Vehicle self-diagnosis", "Measuring method" and "Fault finding" ⇒ Vehicle diagnosis, testing and information system VAS 5051.

#### 1.2 Supplementary instructions and assembly work on vehicles with an air conditioning system



##### WARNING

*Do not open the refrigerant circuit of the air conditioning system.*



##### Note

*In order to avoid damage to the condenser as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.*

Steps which should be taken in order to remove and install the engine without opening the refrigerant circuit.

- Unscrew the holding clamp(s) on the refrigerent lines
- Remove V-ribbed belt ⇒ [page 21](#) .
- Remove the air conditioning compressor ⇒ [page 21](#) .
- Mount the air conditioning compressor and the condenser in such a way that the refrigerent lines/hoses are not under tension.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



### 1.3 Safety precautions when working on the fuel supply system



#### WARNING

- ◆ *On vehicles with engine with unit injectors, the temperature of the fuel lines or of the fuel can be up to 100 °C in an extreme case. Let the fuel cool down before opening the lines, as otherwise there is a high risk of burning.*
- ◆ *The fuel system is under pressure!*
- ◆ *Wear safety goggles and safety clothing, in order to avoid injuries and skin contact.*
- ◆ *Place cleaning cloths around the connection point before detaching cable connections. Reduce pressure by carefully removing the wiring.*

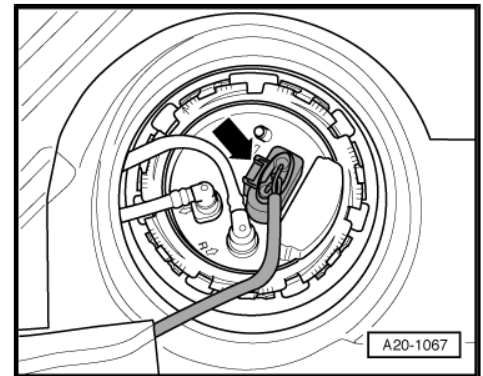
- ◆ The fuel delivery unit is activated by switching on the ignition and the door contact switch of the driver door. Before opening the fuel system and for reasons of safety, if the battery is not disconnected, the connector -arrow- must be disconnected from the fuel delivery unit.



#### WARNING

*When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *Ensure that there is adequate free access to all moving or hot components.*



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for the use of the information in this document. ŠKODA AUTO A. S. ©

When removing and installing the fuel gauge sender from a full or partly filled fuel tank, pay attention to the following:

- ◆ The extraction hose of an exhaust extraction system which is switched on, must be positioned close to the assembly opening of the fuel tank in order to extract the released fuel gases, even before the work is commenced. If no exhaust extraction system is available, a radial fan (motor not in air flow of fan) with a delivery volume of more than 15 m<sup>3</sup>/h must be used.
- ◆ Avoid skin contact with fuel! Wear fuel-resistant gloves!

### 1.4 Safety precautions when working on the fuel supply of the diesel direct injection system

If test and measuring devices are required during test drives observe the following:

- ◆ Always secure the test and measuring devices on the rear seat and have a second person operate them there.

If the test and measuring devices are operated from the passenger seat, the passenger could be injured by the release of the passenger airbag in the event of an accident.

**WARNING**

***Secure the diagnostic device to the rear seat and operate from that position.***

Observe the following points to prevent injury to persons and/or damage to the injection and preheating system:

- ◆ Disconnect and connect wires of the preheating and injection system as well as measuring device wires when the ignition is switched off.
- ◆ If the engine should be run at the starter speed without it actually igniting, then separate the central plug connection for the unit injector at the cylinder head.
- ◆ Before disconnecting the battery determine the code of radio sets fitted with anti-theft coding.
- ◆ Always switch off the ignition before disconnecting and re-connecting the battery. Otherwise the engine control unit may be damaged.
- ◆ When the battery is disconnected and reconnected, carry out additional operations ⇒ Electrical System ⇒ Rep. Gr. 27 .

## 1.5 Regulations concerning cleanliness when working on the fuel supply/fuel injection system

Carefully observe the following “6 rules” for cleanliness when working on the fuel supply/injection system:

- ◆ Thoroughly clean the connection points and their surroundings before releasing.
- ◆ Place removed parts on a clean surface and cover. Do not use fuzzy cloths!
- ◆ Carefully cover or close opened components if the repair is not completed immediately.
- ◆ Only install clean parts: Remove spare parts from their wrapping immediately before installing. Do not use any parts which have been stored unwrapped (e.g. on a shelf or in a tool box etc...).
- ◆ When the system is opened: Avoid using compressed air. Avoid moving the vehicle.
- ◆ Also make sure no diesel fuel runs onto the coolant hoses. If this is the case clean the hoses immediately. Replace immediately any hoses which have suffered damage.

## 1.6 Regulations concerning cleanliness when working on the exhaust gas turbo-charger

Carefully observe the following “5 rules” for cleanliness when working on the exhaust gas turbocharger:

- ◆ Thoroughly clean the connection points and their surroundings before releasing.
- ◆ Place removed parts on a clean surface and cover. Do not use fuzzy cloths!
- ◆ Carefully cover or close opened components if the repair is not completed immediately.



- ◆ Only install clean parts: Remove spare parts from their wrapping immediately before installing. Do not use any parts which have been stored unwrapped (e.g. on a shelf or in a tool box etc...).
- ◆ When the system is opened: Avoid using compressed air. Avoid moving the vehicle.

## 1.7 General instructions for charge air system



### WARNING

*When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *Ensure that there is adequate free access to all moving or hot components.*



### Caution

*In case a mechanical damage to the exhaust gas turbocharger is found, e.g. damage to the compressor wheel, it is not sufficient to only replace the turbocharger. In order to avoid consequential damage, perform the following tasks:*

- ◆ *Clean all oil lines.*
- ◆ *Change the engine oil and replace the oil filter*
- ◆ *Check air filter housing, air filter element and charge air pipes as well as charge air hoses for soiling.*
- ◆ *Check all air guides and charge air cooler for foreign bodies.*

*If foreign bodies are detected in the charge air system, the charge-air routing must be cleaned and the charge air cooler must be replaced.*

- ◆ Charge-air system must be tight, check ⇒ [page 162](#) .
- ◆ Replace self-locking nuts.
- ◆ Hose connections and hoses for charge air system must be free of oil and grease before being installed. Only gaskets and sealing surfaces of the push-fit couplings are coated with oil ⇒ [page 161](#) .
- ◆ Observe markings on the hoses and components.
- ◆ All the hose connections of the charge air system are secured with spring strap clamps or push-fit couplings.
- ◆ Only use approved clamps for securing the hose connections ⇒ Electronic Catalogue of Original Parts .
- ◆ Use pliers for spring strap clamps to fit the spring strap clips.
- ◆ Assembly of hose connections with push-fit couplings ⇒ [page 161](#) .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



- ◆ Before screwing down the oil feed line, fill the exhaust turbo-charger via the connection fitting with engine oil.
- ◆ After installing the turbocharger, run engine at idling speed for about 1 minute to ensure that oil is supplied to the turbocharg-er.

# ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 10 – Removing and installing engine

### 1 Removing and installing engine

#### Special tools and workshop equipment required

- ◆ Catch pan , e.g. - VAS 6208-
- ◆ Engine/gearbox jack , e.g. -V.A.G 1383/A-
- ◆ Pliers for spring strap clamps
- ◆ Double ladder , e. g. -VAS 5085-
- ◆ Engine mount -T10012-
- ◆ Assembly stand -MP 9-101-
- ◆ Engine / gearbox mount - MP 1-202-
- ◆ Supporting device -T30099-
- ◆ Hook for T30099 -MP9-200/10 (10-222A/10)-
- ◆ Shim -T30099/1-
- ◆ Workshop crane , e.g. -VAS 6100-

#### 1.1 Removing



##### Note

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability

- ◆ *The engine is removed downwards together with the gearbox.*
- ◆ *All cable straps that have been loosened or cut open when the engine was removed must be fitted again in the same location when the engine is installed again.*
- ◆ *Collect drained coolant in a clean container for proper disposal or reuse.*



##### Caution

*When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *In order to avoid damage to the cables, ensure that there is adequate free access to all moving or hot components.*

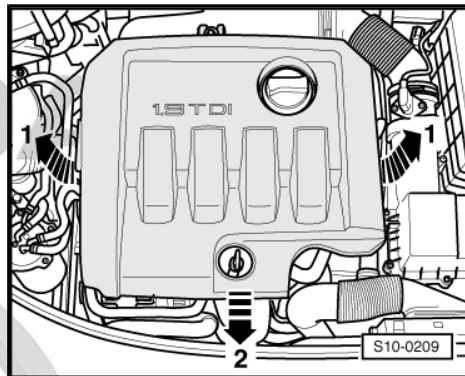
Observe all safety measures and notes for assembly work on the fuel supply and injection system, at the charge air system and observe as well the rules for cleanliness ⇒ [page 2](#) .



- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.
- Remove air filter and intake air duct ➔ [page 175](#).

**WARNING**

*Observe measures when disconnecting the battery ➔ Electrical System ➔ Rep. Gr. 27.*



- Remove battery and battery tray ➔ Electrical System ➔ Rep. Gr. 27.
- Remove cover and intermediate wall of the plenum chamber ➔ Body Work ➔ Rep. Gr. 66.
- Remove both front wheels ➔ Chassis ➔ Rep. Gr. 44.
- Remove noise insulation ➔ Body Work ➔ Rep. Gr. 50.
- Remove the front right and left wheelhouse liner ➔ Body Work ➔ Rep. Gr. 66.

**WARNING**

*Hot steam or hot coolant may escape when the compensation bottle is opened. Cover the cap with a cloth and open carefully.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

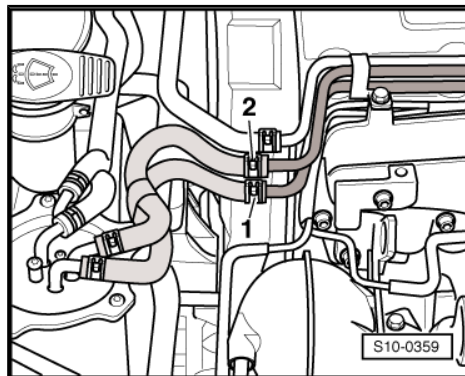
- Drain coolant ➔ [page 106](#).

**WARNING**

- ◆ *On vehicles with engine with unit injectors, the temperature of the fuel lines or of the fuel can be up to 100 °C in an extreme case. Let the fuel cool down before opening the lines, as otherwise there is a high risk of burning.*
- ◆ *Wear protective gloves.*
- ◆ *Wear safety goggles.*

- Detach coolant hose, fuel intake hose -2- and fuel return-flow hose -1- from pipes at cylinder head.

For vehicles manufactured up to 08.05

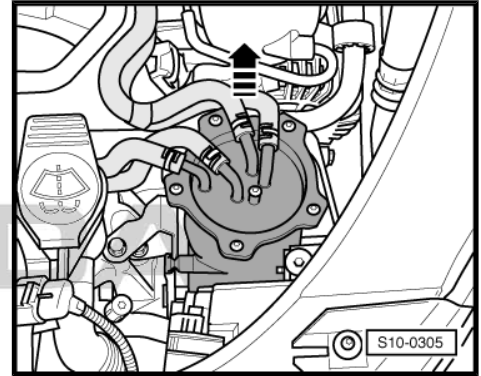






- Unlatch fuses, remove fuel filter with its connected lines upwards from bracket -arrow- and lay to the side.

For vehicles manufactured as of 08.05



ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



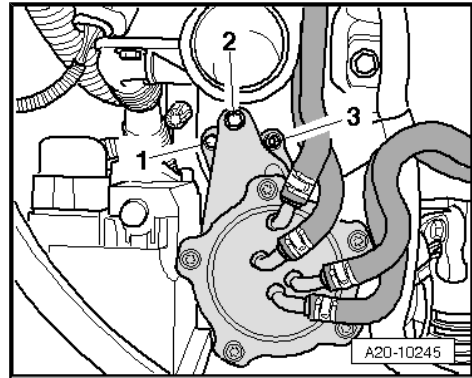
- Release screw -1- by one turn.
- Release screw -2- and nut -3-.
- Take out fuel filter with connected hoses and lay to the side.

Continued for all vehicles



#### Note

*Mark the direction of rotation with chalk or a felt-tip pen before removing the V-ribbed belt. Reversing the rotation direction of an already used belt may destroy it.*



- Remove V-ribbed belt ⇒ [page 21](#) .
- Remove alternator ⇒ Electrical System ⇒ Rep. Gr. 27 .

On vehicles with air conditioning



#### WARNING

**Refrigerant circuit of the air conditioning system must not be opened.**



#### Note

*In order to avoid damage to the AC compressor as well as to the refrigerant lines and hoses, ensure that the lines and hoses are not over-tensioned, kinked or bent.*

- Remove AC compressor and holder for auxiliary units ⇒ Heating, Air Conditioning ⇒ Rep. Gr. 87 .
- Tie up removed AC compressor with connected refrigerant hoses to the body.

Continued for all vehicles

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for errors in this document. Copyright by ŠKODA AUTO A. S. ©

- Remove charge air hoses and charge air pipe between engine and charge air cooler.
- ♦ Engine identification characters BJB, BKC, BXE: ⇒ [page 157](#)
- ♦ Engine identification characters BLS: ⇒ [page 159](#)
- Remove fan shroud and radiator ⇒ [page 112](#) .

On vehicles with auxiliary heating.

- Separate coolant hoses on the auxiliary heating.
- Remove exhaust pipe of auxiliary heating (only for vehicles with extended exhaust pipe) ⇒ Heating, Air Conditioning ⇒ Rep. Gr. 82 .

Continued for all vehicles

- Remove right drive shaft ⇒ Chassis ⇒ Rep. Gr. 40 .
- Unscrew left drive shaft from the flange shaft of the gearbox and tie up.





- Release screws -1 ... 3- and remove pendulum support.

## On four-wheel drive vehicles

- Remove the assembly carrier ➔ Chassis ➔ Rep. Gr. 40 .
- Disconnect propshaft from gearbox ➔ Gearbox ➔ Rep. Gr. 39 .

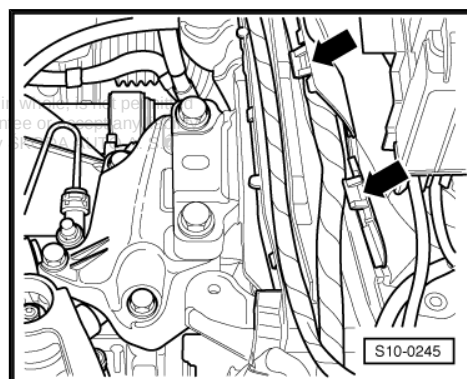
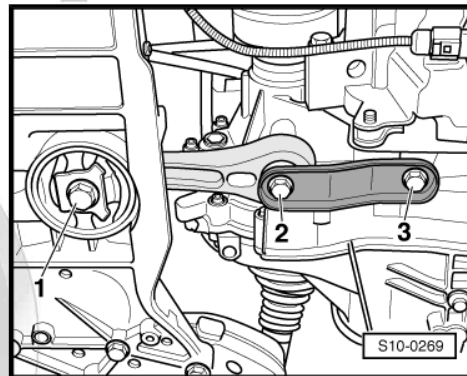
## Continued for all vehicles



### Note

*The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - danger of damaging it.*

- Remove front exhaust pipe from exhaust turbocharger ➔ [page 185](#) .
- Unlatch the fuse and unplug the connector from the engine control unit, open the cable guides -arrows-, remove the engine wiring harness and lay to the side.
- Release all remaining plugs at engine and gearbox and lay aside the relevant lines.
- Unclamp all connecting, coolant, vacuum and suction hoses from the engine.
- Remove shift mechanism from gearbox ➔ gearbox ➔ Rep. Gr. 34 .
- Remove hydraulic clutch control from gearbox ➔ Gearbox ➔ Rep. Gr. 34 .



### WARNING

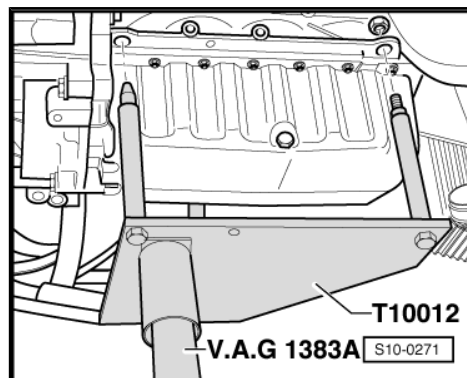
*After removing the slave cylinder or after separating the hydraulic line, do not depress the clutch pedal.*

- Screw on - T10012- engine mount to the cylinder block with fixing nut and bolt. Tighten bolt M10x25/8.8 to a tightening torque of approx. 40 Nm.
- Insert engine/gearbox jack (e.g. -V.A.G 1383/A- ) into engine mount - T10012- and slightly raise.

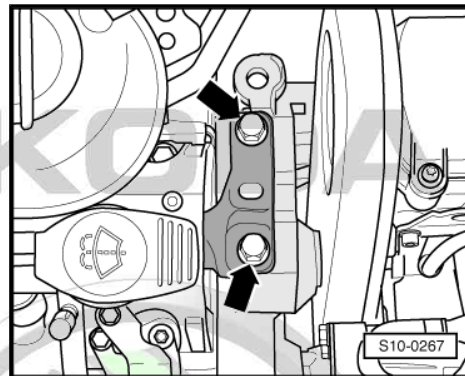


### Note

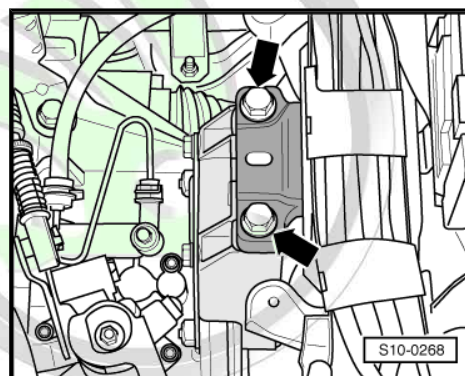
*Use double ladder (e. g. -VAS 5085- ) to release the screws for the assembly bracket.*



- Screw in successively screws for assembly bracket at engine -arrows- ...

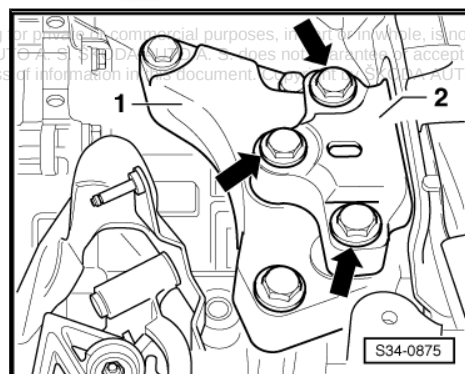


- ... and at gearbox 0A4 -arrows- or ...



- ... at gearbox 02Q -arrows- or ...

Protected by copyright. Copying or publishing for commercial purposes, in whole or in part, is not permitted unless authorised by ŠKODA A.U. S. p. A. ŠKODA A.U. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright © 2004 ŠKODA A.U. S. & Š.

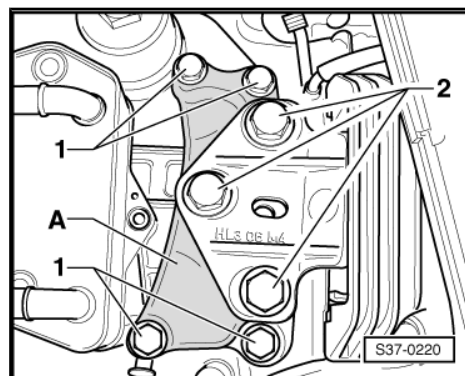


- ... at gearbox 02E -2-.



#### Note

- ◆ Check whether all hose and line connections between engine, gearbox and body are released.
  - ◆ When lowering carefully guide the engine/gearbox jack unit, in order to avoid damage.
  - ◆ Ensure adequate clearance to the AC compressor, or especially ensure free passage between drive shaft and turbo-charger.
- First of all slightly lower the engine/gearbox unit. Then push engine/gearbox unit forwards and only then lower further.
  - Remove the gearbox from the engine ⇒ gearbox ⇒ Rep. Gr. 34 .



### 1.1.1 Securing the engine to the assembly stand

#### Special tools and workshop equipment required

- ◆ Lifting device -MP9-201 (2024 A)-
- ◆ Engine / gearbox mount - MP 1-202-
- ◆ Extension -MP 1-202/10-
- ◆ Bushing -T30010 (VW540/1B)-
- ◆ Assembly stand -MP 9-101-
- ◆ Workshop crane , e.g. -VAS 6100-

#### Procedure

- Separate engine from gearbox.



#### WARNING

*Use securing pins on the hooks and rig pins to prevent release.*

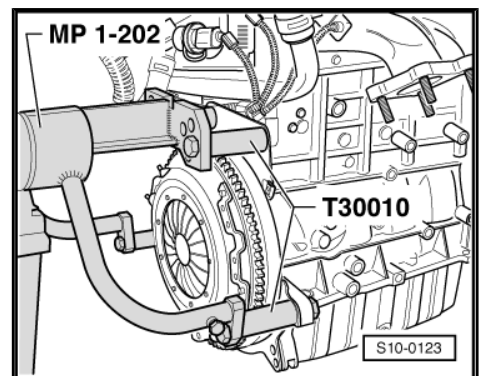
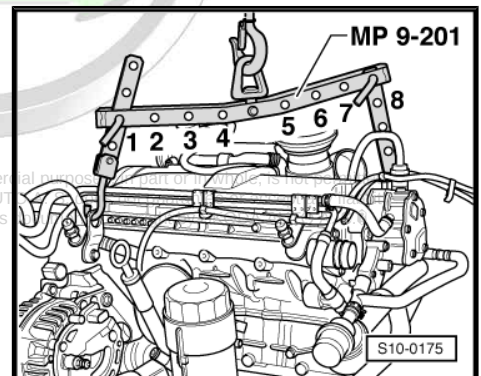
- Attach lifting device -MP9-201 (2024 A)- at engine and at workshop crane (e.g. -VAS 6100- ).

Belt pulley side: 2nd hole of the extension in Position 1.

Flywheel side: 4th hole of the extension in Position 8.

- Lift off engine with installed engine mount -T10012- with workshop crane (e.g. -VAS 6100- ) from engine/gearbox jack.
- Remove engine mount -T10012- .

- For carrying out assembly work, attach the engine with the engine mount -MP 1-202- , the extension -MP 1-202/10- and the sleeve -T30010 (VW540/1B)- to the assembly stand -MP 9-101- . (The figure shows the 1.9ltr./47kW SDI Engine; the fixing system is identical).



## 1.2 Install

#### Procedure

- Mount engine onto engine mount -T10012- .

Installation is performed in a similar way in the reverse order. Pay attention to the following points:

**Note**

- ◆ *Replace self-locking nuts when assembling.*
- ◆ *Always replace gasket rings and seals.*
- ◆ *All cable straps should be fitted on again in the same place when installing.*
- ◆ *Secure all hose connections with corresponding hose clips.*

**Caution**

*When undertaking all installation work, particularly in the engine compartment due to its cramped construction, please observe the following:*

- ◆ *Lay lines of all kinds (e.g. for fuel, hydraulic fluid, cooling fluid and refrigerant, brake fluid, vacuum) and electrical lines in such a way that the original line guide is re-established.*
- ◆ *In order to avoid damage to the cables, ensure that there is adequate free access to all moving or hot components.*

**Engines with coupling for manual gearbox 0A4 and 02Q****Note**

- ◆ *Clean the serration on the drive shaft and if the clutch discs have been used clean the hub serration, remove corrosion and only apply a very thin layer of grease -G 000 100-. Subsequently move the clutch disc up and down on the drive shaft until the hub fits smoothly on the shaft. Always remove excess grease.*
- ◆ *After installing the coupling, check the centering of the clutch disc ⇒ Manual Gearbox ⇒ Rep. Gr. 34.*
- ◆ *Inspect clutch release. Replace bearing if worn ⇒ gearbox ⇒ Rep. Gr. 34.*

**Engine without coupling for the automatic gearbox 02E****Note**

- ◆ *Check bearing for drive shaft pin in the crankshaft. Replace bearing if worn ⇒ [page 47](#).*
- ◆ *Lubricate bearing and drive shaft pin with a thin layer of high temperature grease -G 052 133 A2-. Do not grease the serration of the drive shaft.*

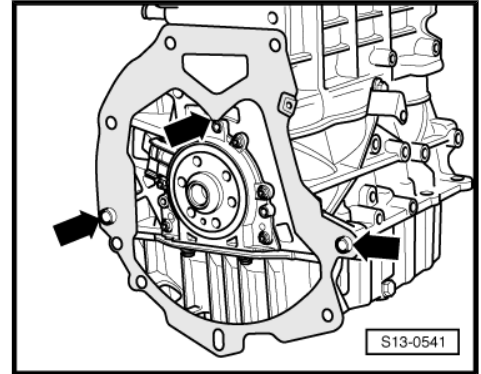
**Continued for all engines**

- Check whether the dowel sleeves for centering the engine/gearbox are present in the cylinder block; insert if necessary.

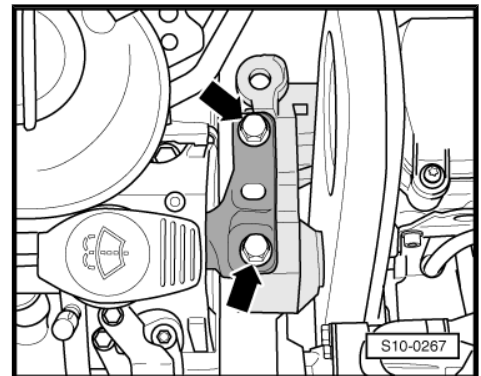
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



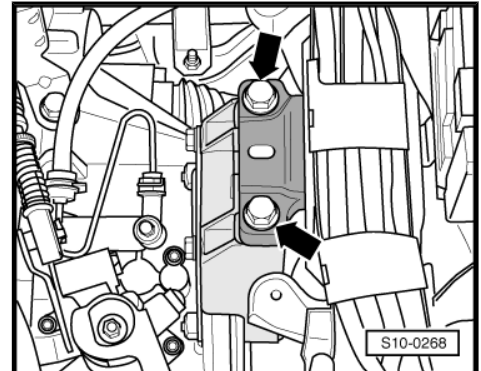
- Ensure that the intermediate plate has been inserted on the sealing flange and is pushed onto the dowel sleeves -arrows-.
- Screw on the gearbox to the engine ➔ [page 17](#) .
- Insert engine/gearbox assembly in the body.



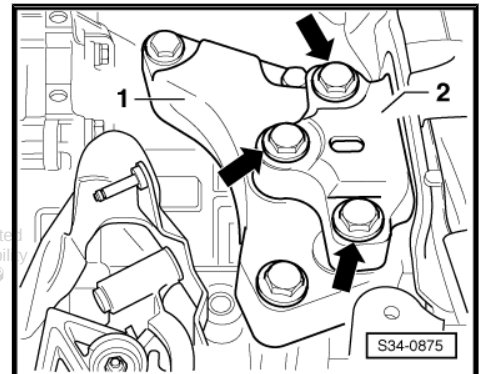
- Screw in successively screws for assembly bracket at engine -arrows- ...



- ... and at gearbox 0A4 -arrows-, or ...



- ... at the gearboxes 02Q or 02E -arrows-.



#### Note

*Use new screws for attaching. First tighten the screws by hand, after aligning the assembly bracket tighten screws to a final torque.*

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for errors or omissions. Copyright by ŠKODA AUTO A. S. 2004

- Remove engine mount -T10012- from engine.

#### On four-wheel drive vehicles

- Attach propshaft to gearbox ➔ Gearbox ➔ Rep. Gr. 39 .
- Install the assembly carrier ➔ Chassis ➔ Rep. Gr. 40 .

#### Continued for all vehicles

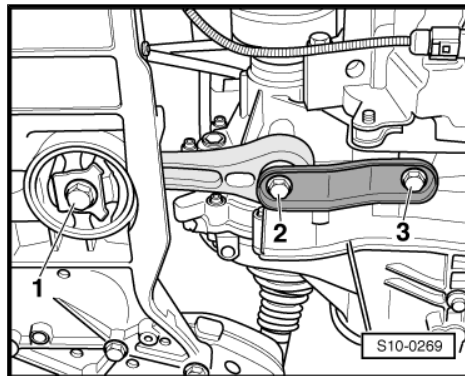
- Tighten pendulum support with screws -1 ... 3- at gearbox and at assembly carrier. Use new screws for attaching.
- Install drive shafts on gearbox ⇒ Chassis ⇒ Rep. Gr. 40 .
- Install exhaust system and align free of stress ⇒ [page 195](#) .
- Install and bleed hydraulic clutch control ⇒ gearbox ⇒ Rep. Gr. 30 .
- Attach shift mechanism to gearbox and adjust ⇒ gearbox ⇒ Rep. Gr. 34 .
- Install radiator and fan ⇒ [page 112](#) .

#### On vehicles with air conditioning

- Installing holder for auxiliary units and AC compressor ⇒ [page 21](#) .

#### Continued for all vehicles

- Install alternator ⇒ Electrical System ⇒ Rep. Gr. 27 .
- Install the V-ribbed belt ⇒ [page 21](#) .
- Observe the assembly instruction for hose connections with push-fit couplings ⇒ [page 161](#) .
- Adjust assembly bracket ⇒ [page 17](#) .
- Connect electrical connections and attach cables ⇒ Current flow diagrams and Fitting locations.
- Install battery ⇒ Electrical System ⇒ Rep. Gr. 27 .
- Install the intermediate wall and cooling water tank cover ⇒ Body Work ⇒ Rep. Gr. 66 .
- Install wiper arms ⇒ Electrical System ⇒ Rep. Gr. 92 .
- Install the noise insulation ⇒ Body Work ⇒ Rep. Gr. 50 .
- Install the front right and left wheelhouse liner ⇒ Body Work ⇒ Rep. Gr. 66 .
- Top up coolant ⇒ [page 106](#) .



#### Note

- ◆ *Only then re-use drained coolant, if the cylinder head or cylinder block were not replaced.*
- ◆ *Dirty coolant must not be used again.*
- Checking the oil level ⇒ Maintenance ; Octavia II .
- Perform a test drive.
- Interrogate all fault memories, rectify any faults existing and erase fault memory ⇒ Vehicle diagnosis, testing and information system VAS 5051.



#### Note

*After deleting the fault memory of the engine control unit the readiness code must be re-generated.*

## Tightening torques

| Component                                                |     | Nm                        |
|----------------------------------------------------------|-----|---------------------------|
| Screws/nuts                                              | M6  | 9                         |
|                                                          | M7  | 13                        |
|                                                          | M8  | 20                        |
|                                                          | M10 | 40                        |
|                                                          | M12 | 70                        |
| In variation of this:                                    |     |                           |
| Pendulum support to gearbox                              |     | ⇒ <a href="#">page 17</a> |
| Pendulum support to assembly carrier                     |     | ⇒ <a href="#">page 17</a> |
| Engine/gearbox connecting screws ⇒ gearbox ⇒ Rep. Gr. 34 |     |                           |

### 1.2.1 Align unit mounting

#### Special tools and workshop equipment required

◆ Supporting device -T30099-

◆ Shim -T30099/1-

◆ Hook -MP9-200 (10-222A)-

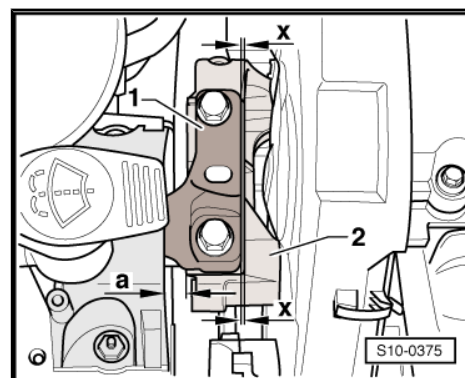
The following distances must be achieved:

- Between engine bracket and engine support there must be a distance -a- = 10 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- (dimension -x- = dimension -x-).



#### Note

The distance -a- = 10 mm can be checked e.g. with suitable round bars.



### 1.2.2 Assembly bracket

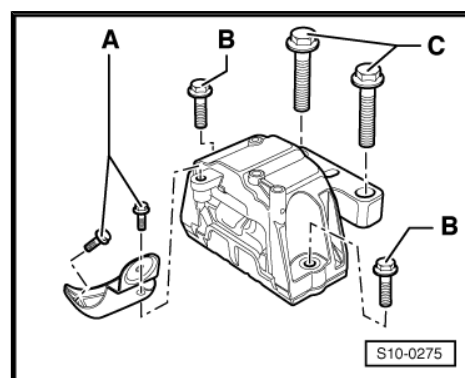
#### Tightening torques

##### Engine assembly bracket

A - 20 Nm + 90° (1/4 turn) - replace

B - 40 Nm + 90° (1/4 turn) - replace

C - 60 Nm + 90° (1/4 turn) - replace

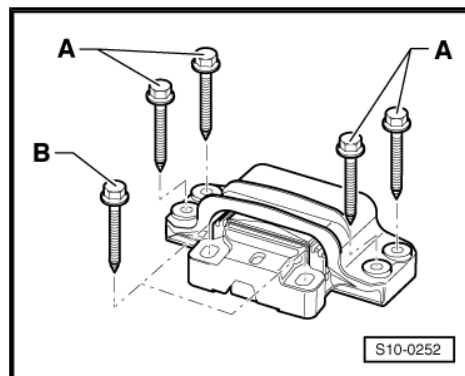




### Assembly bracket gearbox 0A4

A - 40 Nm + 90° (1/4 turn) - replace

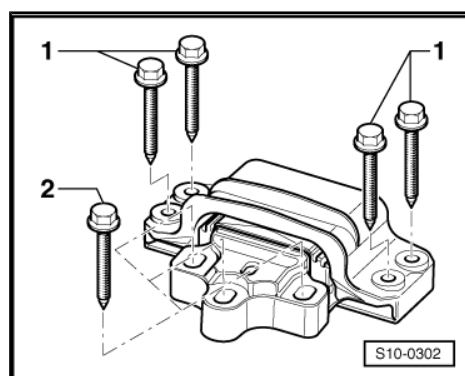
B - 60 Nm + 90° (1/4 turn) - replace



### Assembly bracket gearbox 02E and 02Q

1 - 40 Nm + 90° (1/4 turn) - replace

2 - 60 Nm + 90° (1/4 turn) - replace



### Pendulum support

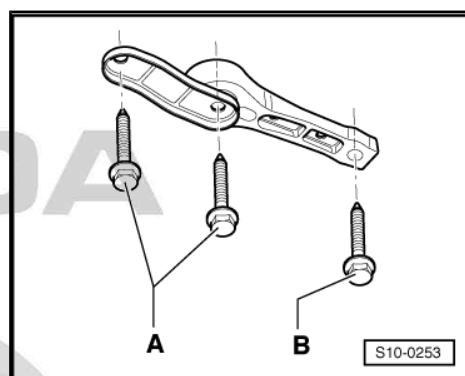
A grade 8.8 - 40 Nm + 90° (1/4 turn) - replace

A grade 10.9 <sup>1)</sup> - 50 Nm + 90° (1/4 turn) - replace

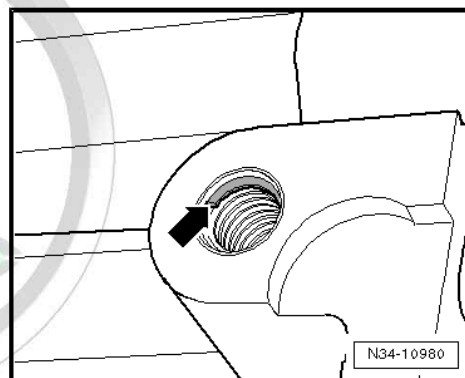
B - 100 Nm + 90° (1/4 turn) - replace

Remove: first release screw -B-, then screws -A-.

Install: first tighten screws -A-, then screw -B-.



<sup>1)</sup> On manual gearbox MQ350 (02Q), only use the screws with the grade 10.9 if threaded inserts have been installed (e. g. Hel-iCoil) -arrow-.



## 1.3 Inspecting and adjusting the assembly bracket

### 1.3.1 Check assembly bracket

Check dimensions on the right hanger for engine/gearbox unit:

- Between engine bracket and engine support there must be a distance -a- of 10...13 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.

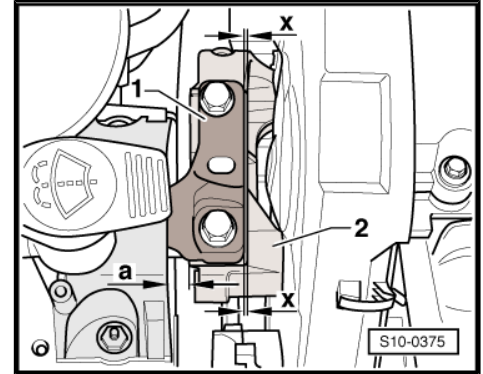


#### Note

*The distance -a- can be checked e.g. with suitable round bars.*

Only if there is an acoustic complaint (engine or gearbox knock on the frame side rail when cornering) and the dimension -a- is not 10...13 mm:

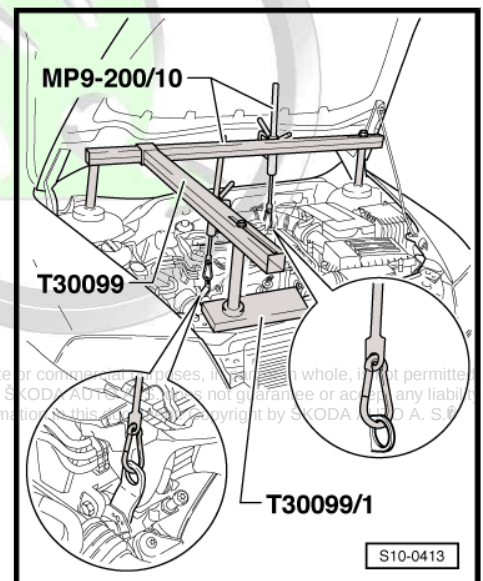
- Adjust assembly bracket ⇒ [page 19](#) .



### 1.3.2 Adjust assembly bracket

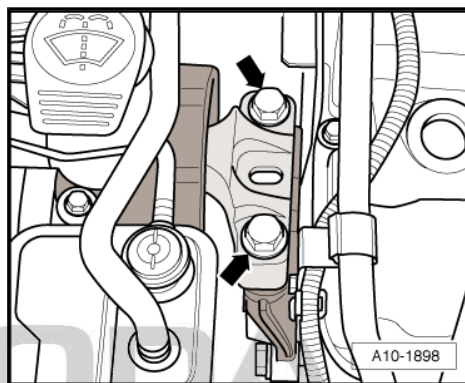
Special tools and workshop equipment required

- ◆ Supporting device -T30099-
- ◆ Shim -T30099/1-
- ◆ Hook -MP 9-200/10 (10-222A/10)-
- Remove battery and battery tray ⇒ Electrical System ⇒ Rep. Gr. 27 .
- Remove the cooling water tank cover ⇒ Body Work ⇒ Rep. Gr. 66 .
- Position supporting device -T30099- and shim -T30099/1 - and support the engine/gearbox unit in its installed position.
- Uniformly pre-tension the engine/gearbox unit with both spindles, but do not raise.

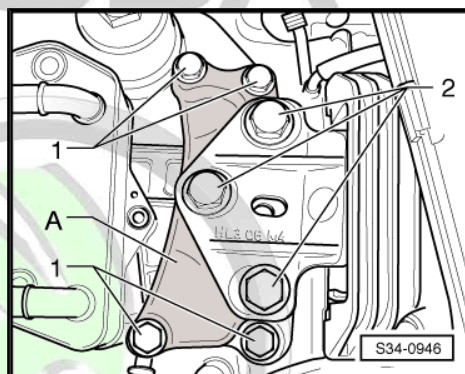


Protected by copyright. Copying for private or commercial purposes, in whole or in part, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

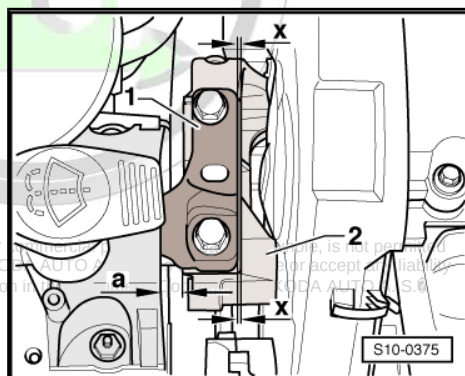
- Release the screws -arrows- of the assembly bracket at engine.



- Slightly loosen the screws -2- of the assembly bracket at the gearbox (less than 1 revolution).
- Successively replace all the screws of the assembly bracket (as long as it has not already been performed when installing the engine) and insert these loosely.



- Move the engine/gearbox unit with a tyre lever between engine support -1- and supporting arm -3- for engine mount until the following dimensions are set:
- Between engine bracket and engine support there must be a distance -a- of 10 mm.
- The cast iron edge on the engine support -2- must be parallel to the supporting arm -1- the dimension -x- must be the same at the front and rear.

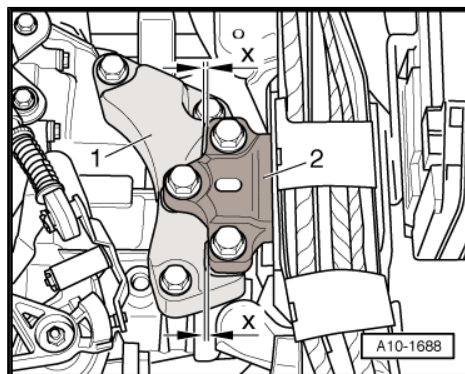


**Note**

The distance -a- = 10 mm can be checked e.g. with suitable round bars.

- Tighten screws for engine mounting ➔ [page 17](#) .
- Make sure that on the gearbox side the edges of the supporting arm -2- and gearbox support -1- are parallel.
- The dimension -x- must be the same on both mount sides.
- Tighten screws for gearbox mounting ➔ [page 17](#) .

Further installation occurs in reverse order.



## 13 – Crankgear

### 1 Removing and installing a V-ribbed belt and a timing belt

#### 1.1 Removing and installing V-ribbed belt

##### 1 - V-ribbed belt pulley

- ☐ with vibration damper
- ☐ Adjust ⇒ [page 26](#) TDC with the belt pulley fitted

##### 2 - Cap

- ☐ mounted up to 05.05

##### 3 - 10 Nm + torque a further 90° (1/4 turn)

- ☐ replace

##### 4 - Tensioning device for V-ribbed belt

- ☐ swivel tensioning device for V-ribbed belt with open-end wrench to slacken the V-ribbed belt
- ☐ Tensioning device can be interlocked with locating bolts -T10060- or Allan key.

##### 5 - 23 Nm

##### 6 - Bracket for auxiliary units

- ☐ order of tightening ⇒ [page 22](#)

##### 7 - Bushing

##### 8 - 23 Nm

##### 9 - AC generator

- ☐ removing and installing ⇒ Electrical System ⇒ Rep. Gr. 27
- ☐ to facilitate positioning, drive the threaded bushings of the retaining screws at the generator slightly backwards

##### 10 - 45 Nm

- ☐ insert using locking agent -D 000 600 A2-
- ☐ order of tightening ⇒ [page 22](#)

##### 11 - Bushing

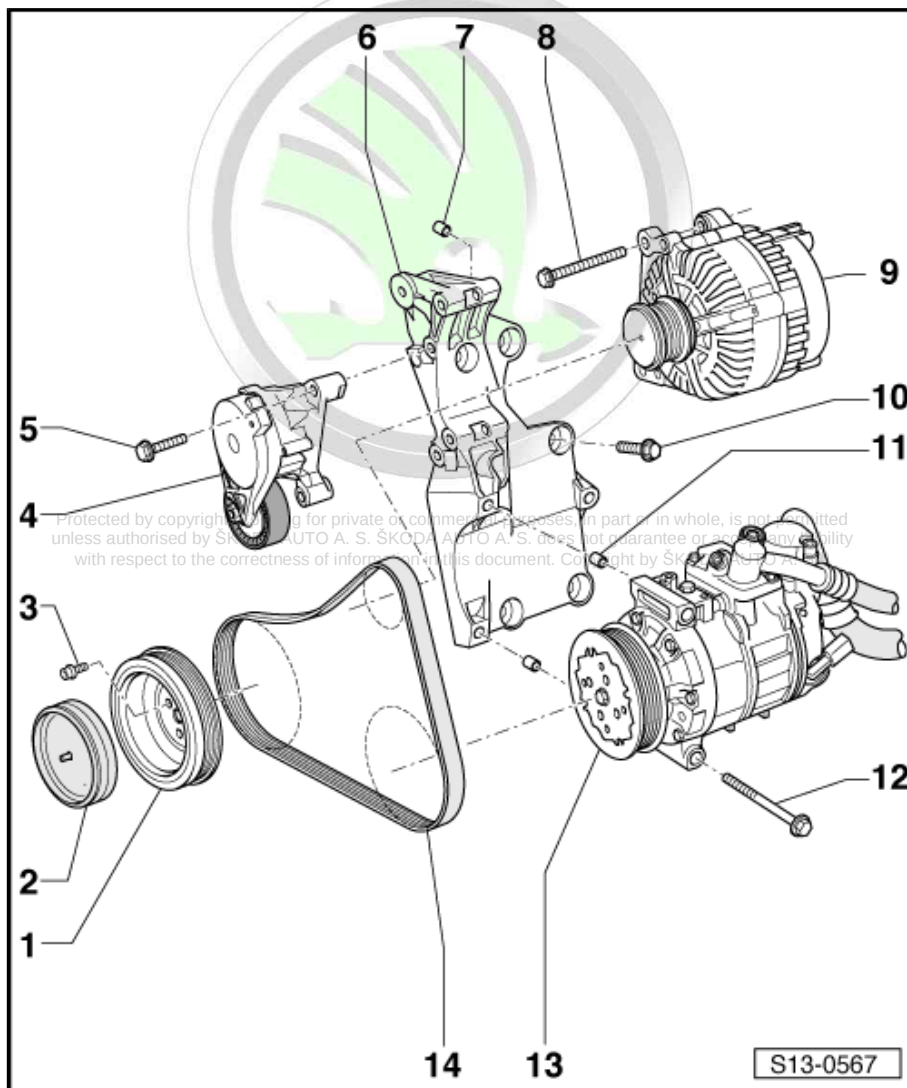
- ☐ 2 pieces

##### 12 - 25 Nm

##### 13 - AC compressor

##### 14 - V-ribbed belt

- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing

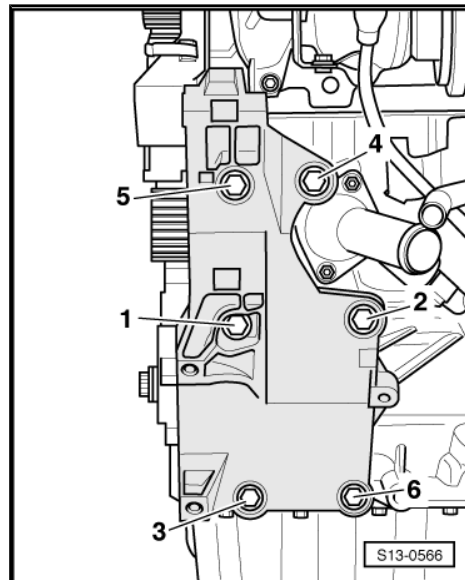




- ☐ check for wear
- ☐ do not kink
- ☐ removing ➔ [page 22](#)
- ☐ installing ➔ [page 23](#)

### Bolts at bracket for auxiliary units - tightening sequence

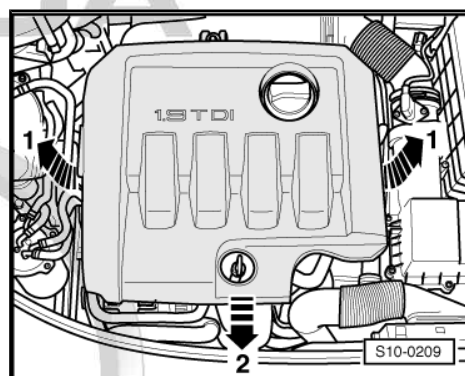
#### Removing



### Special tools and workshop equipment required

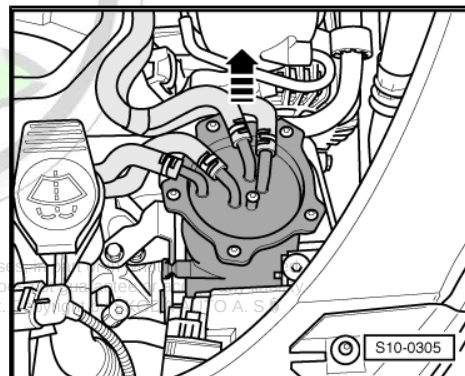
- ◆ Locating bolts -T10060A-
- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.

For vehicles manufactured up to 08.05



- Unlatch fuses, remove fuel filter with its connected lines upwards from bracket -arrow- and lay to the side.

For vehicles manufactured as of 08.05



Protected by copyright. Copying for private or commercial purposes without the written permission of ŠKODA AUTO A. S. is prohibited. ŠKODA AUTO A. S. does not accept any responsibility for the correctness of information in this document.



- Release screw -1- by one turn.
- Release screw -2- and nut -3-.
- Take out fuel filter with connected hoses and lay to the side.

#### For vehicles with auxiliary heating

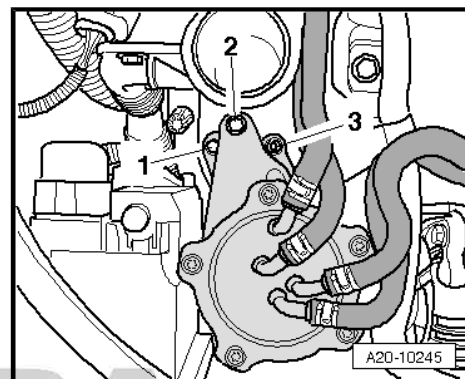
- Remove the front right wheelhouse liner ⇒ Body Work ⇒ Rep. Gr. 66 .

#### Continued for all vehicles

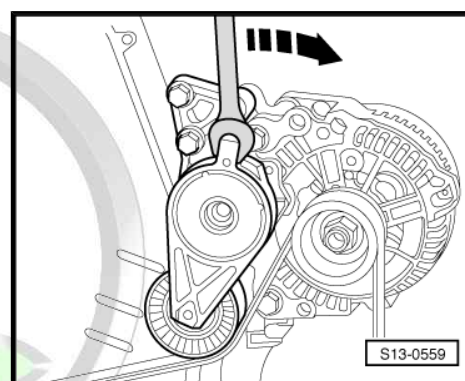


#### Note

Mark the direction of rotation with chalk or a felt-tip pen before removing the V-ribbed belt. Reversing the rotation direction of an already used belt may destroy it.



- Swing the the tensioning device in -the direction of the arrow- detension the V-ribbed belt.



- Lock the tensioner with the locating bolt -T10060A- .
- Remove the release ribbed V-belt.

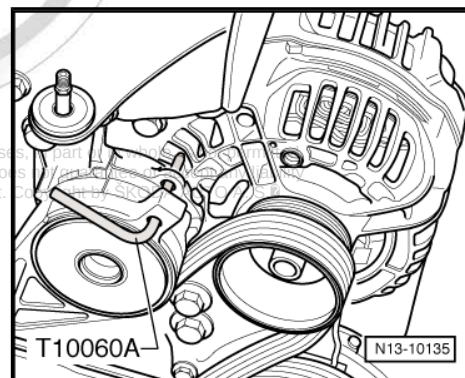
#### Install

Installation is performed in the reverse order, pay attention to the following points:



#### Note

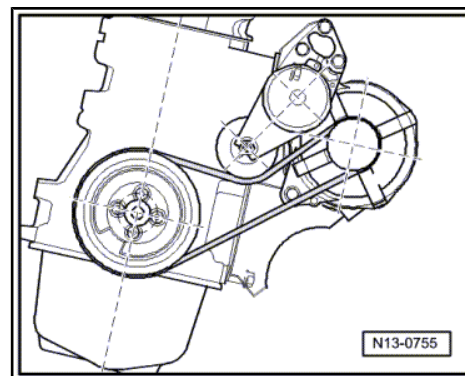
Before fitting the V-ribbed belt make sure that all assemblies (generator and AC compressor) are securely mounted.



#### On vehicles without air conditioning

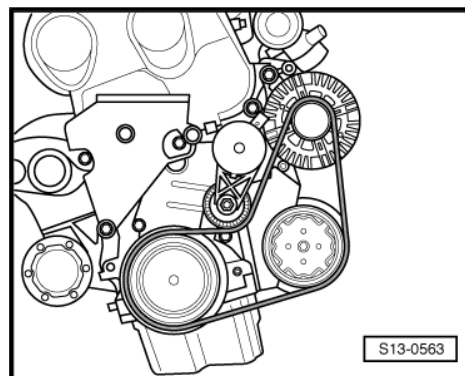
- First lay the V-ribbed belt on the belt pulley of the crankshaft and generator, then release the tensioning device.

#### On vehicles with air conditioning





- First position the ribbed V-belt on the belt pulleys of the crankshaft and AC compressor and on the belt pulley of the generator last; then release the tensioning device.
- Check correct positioning of the ribbed V-belt on the belt pulleys.
- Start engine and check belt run.



## 1.2 Removing and installing toothed belt

### 1 - Top toothed belt guard

- ☐ to remove, remove the right charge air pipe
- ☐ when installing, carefully insert into the middle toothed belt guard

### 2 - 100 Nm

- ☐ to release and tighten use the counterholder - T10051-

### 3 - 20 Nm + torque a further 45° (1/8 turn)

### 4 - Camshaft sprocket

- ☐ Mark installation position

### 5 - Hub

- ☐ with sensor rotor for the Hall sensor -G40-
- ☐ to release and tighten use the counterholder - T10051-
- ☐ to remove the extractor -T10052- use
- ☐ removing and installing ⇒ [page 74](#)

### 6 - 10 Nm

- ☐ insert using locking agent -D 000 600 A2-

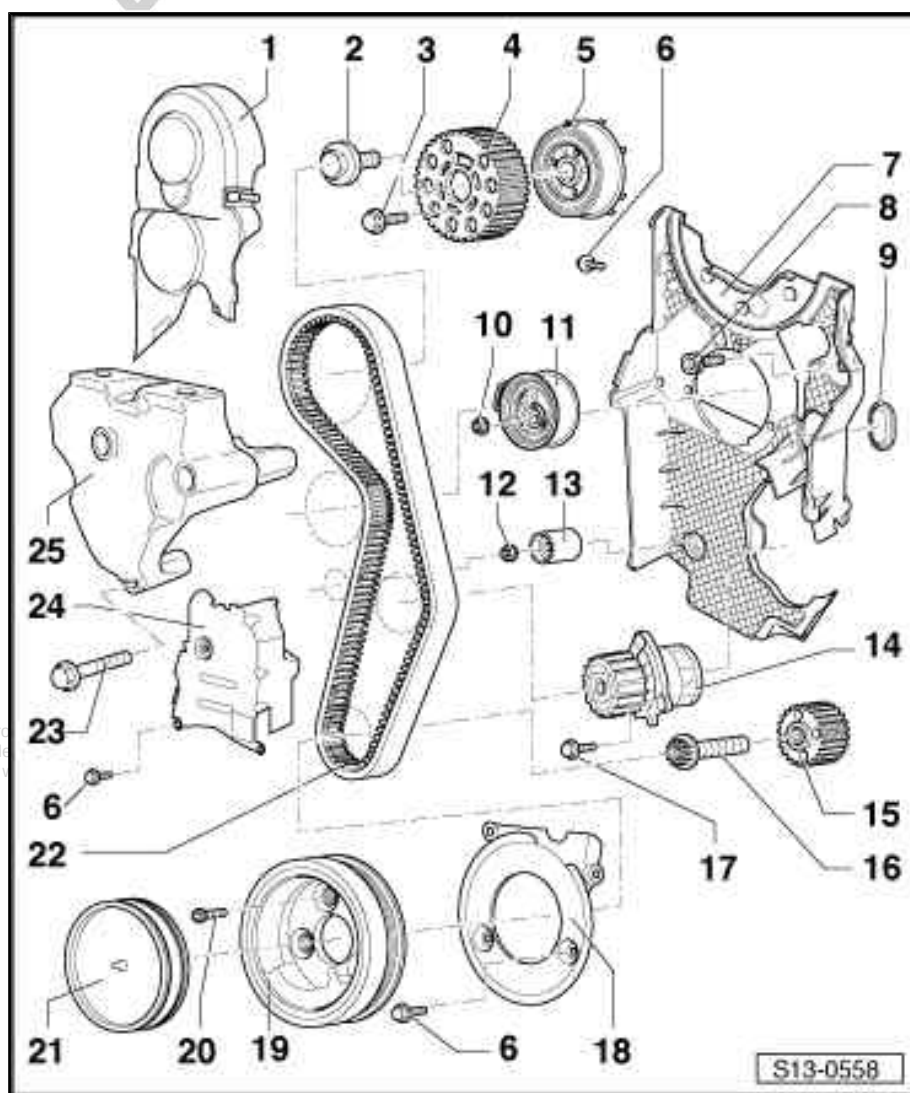
### 7 - Rear toothed belt guard

- ☐ to remove, unscrew coolant pump
- ☐ When installing carefully insert into the front sealing flange

### 8 - 25 Nm

### 9 - Rubber grommet

- ☐ replace if damaged





10 - 20 Nm + torque a further 45° (1/8 turn)

11 - Tensioning pulley

- ☐ The eccentric of the new version has an additional hole for 6 mm hexagon socket wrench ⇒ [page 26](#)

12 - 22 Nm

13 - Guide pulley

14 - Coolant pump

- ☐ removing and installing ⇒ [page 109](#)

15 - Crankshaft toothed belt sprocket

- ☐ there must not be any oil present on the contact surface between the toothed belt sprocket and the crankshaft
- ☐ can be installed only in one position

16 - 120 Nm + torque a further 90° (1/4 turn)

- ☐ replace
- ☐ do not oil
- ☐ to release and tighten use the counterholder -T30004-

17 - 13 Nm

18 - Bottom toothed belt guard

19 - V-ribbed belt pulley

- ☐ with vibration damper
- ☐ Adjust ⇒ [page 26](#) TDC with the belt pulley fitted

20 - 10 Nm + torque a further 90° (1/4 turn)

- ☐ replace

21 - Cap

- ☐ mounted up to 05.05

22 - Toothed belt

- ☐ mark the direction of rotation with chalk or a felt-tip pen before removing
- ☐ check for wear
- ☐ removing ⇒ [page 27](#)
- ☐ install (set the timing) ⇒ [page 30](#)



Note

*When carrying out engine repair replace the toothed belt (apart from regular change interval), it is recorded in the Service Schedule!*

23 - 40 Nm + torque a further 180° (1/2 turn)

- ☐ replace
- ☐ observe the order of tightening up ⇒ [page 27](#)

24 - Middle toothed belt guard

- ☐ Adjust ⇒ [page 26](#) TDC with the belt pulley fitted
- ☐ to remove, remove top toothed belt guard and unscrew tensioning device for ribbed V-belt.

25 - Engine mount

- ☐ from 05.05 to 05.07 the engine mount is mounted with another support ⇒ [page 26](#)



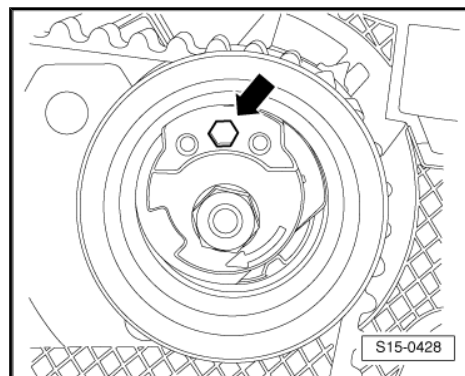
## Tensioning pulley

Additional hole in the eccentric of the tensioning pulley for 6 hexagon socket wrench -arrow-.



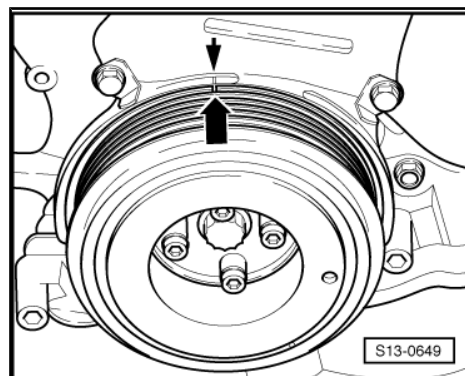
### Note

*The tensioning pulley of the new version can be adjusted with the special two-hole nut turner, e. g. -T10020-, or using a commercial 6 mm hexagon socket wrench.*



## Adjust TDC with the belt pulley fitted

Bring the TDC marking on the crankshaft belt pulley into alignment with the marking on the bottom toothed belt guard as shown.



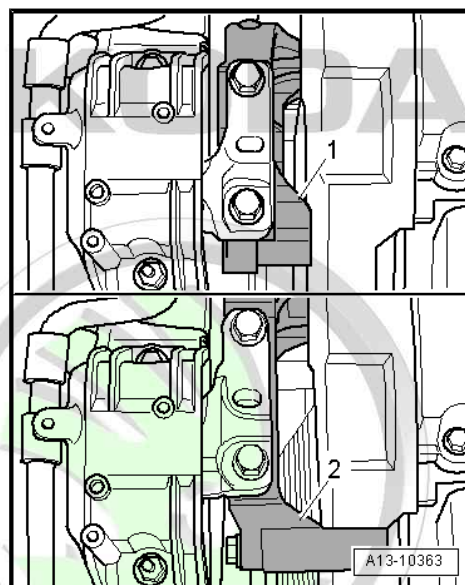
## Engine mount

The engine mount -2- is mounted on vehicles from 05.05 to 05.07.  
The engine mount -1- is mounted on all other vehicles.



### Note

*The engine mount -2- must not be removed when removing the toothed belt!*



## Tightening order for engine support

I : Engine mount for vehicles manufactured from 05.05 to 05.07

II: Engine mount for vehicles manufactured during the period of time from 05.05 to 05.07



### Caution

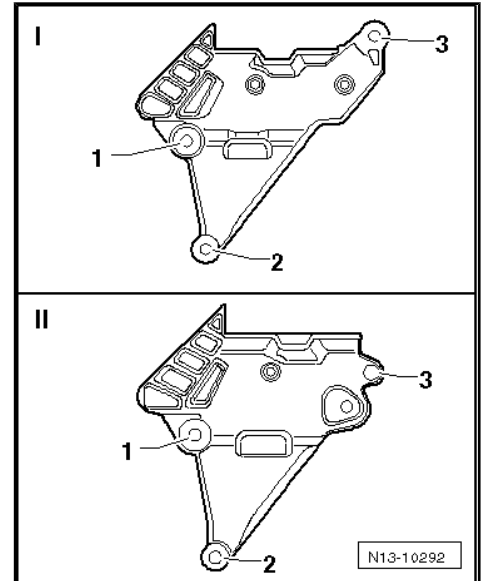
*The tightening sequence and the tightening torque of the fixing screws for the engine support must definitely be respected. Otherwise stress of the engine support occurs, which results in the breaking of the engine support.*

- Screw in screws -1...3- by hand first.
- Tighten screws in the order shown -1...3- to 40 Nm and torque a further 180° (1/2 turn).



### Note

- ◆ Raise or lower engine with the supporting device -T30099- .
- ◆ Before the assembly carrier is installed, all the screws of the engine support must be tightened to the specified tightening torque.



## 1.2.1 Removing



### Note

*When carrying out engine repair replace the toothed belt (apart from regular change interval), it is recorded in the Service Schedule!*

### Special tools and workshop equipment required

- ◆ Supporting device -T30099-
- ◆ Shim -T30099/1-
- ◆ Hook -MP 9-200/10-
- ◆ Rig pin -3359- or -MP 1-301-
- ◆ Crankshaft arrester - T10050- or crankshaft arrester -T10100-
- ◆ Offset screwdriver -T10264-
- ◆ Rig tool - T10265-
- ◆ Pressure pad -T10172- with stud -T10172/4-
- ◆ Pliers for spring strap clamps
- ◆ Locking agent - D 000 600 A2-



### Note

*Mark the direction of rotation with chalk or a felt-tip pen before removing the V-ribbed belt. Reversing the rotation direction of an already used belt may destroy it.*

- remove ribbed V-belt ➔ [page 22](#)
- Remove charge air hose to connection fitting of engine.
- Unscrew the coolant expansion bottle and place with connected hoses onto the cylinder head cover.
- Remove fuel feed line -2- and fuel return line -1-, to do so press latch clips.

**For vehicles manufactured up to 05.05**

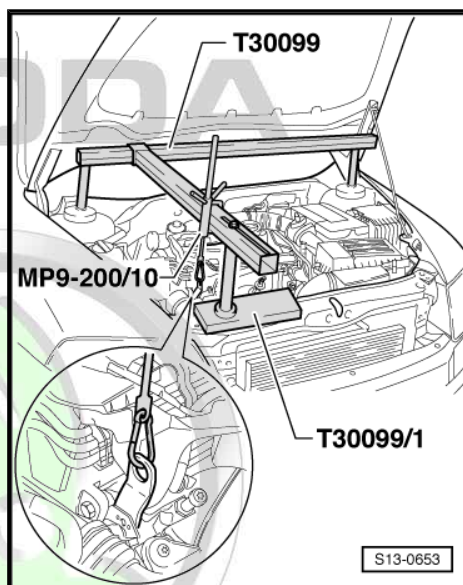
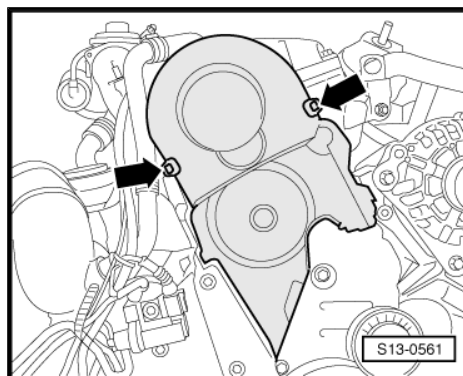
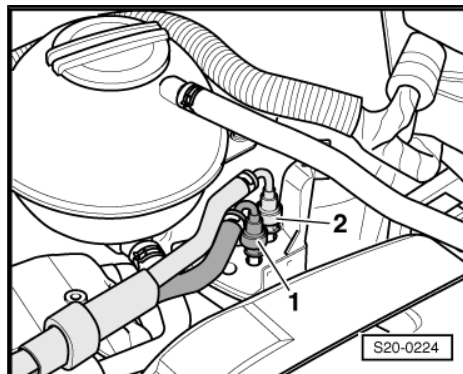
- Remove fuel filter bracket.

**For all vehicles**

- Remove top toothed belt guard, to do so release retaining clips -arrows-.
- Remove ribbed V-belt tensioning device.
- Remove the bottom part of the wheelhouse liner ➔ Body Work ➔ Rep. Gr. 66 .
- Remove V-ribbed belt pulley with vibration damper.
- Unscrew bottom and middle toothed belt guard.

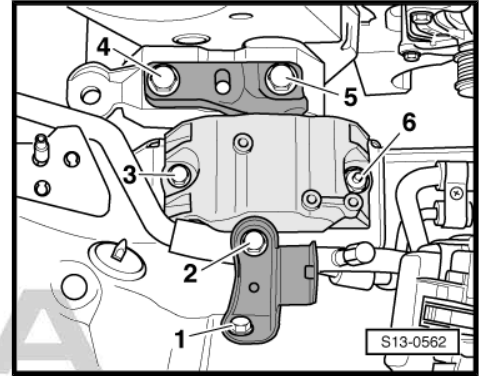
**Except vehicles manufactured during the period of time from 05.05 to 05.07**

- Position the supporting device -T30099- and the base -T30099/1- on the body, suspend the engine on the right lifting eye with hook -MP 9-200/10- and preload via the spindle, however do not lift.





- Release screws -1- and -2- and remove connecting stud.
- Release screws -3 ... 6- and remove engine console.



- Release screws -1 ... 3- and remove engine support.

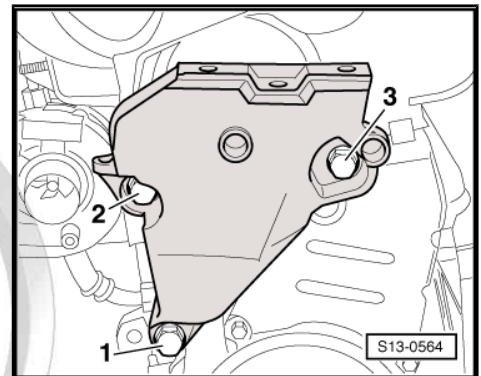
**i Note**

*To release the bolts for the engine support, raise or lower engine slightly via spindle of supporting device -T30099- .*

**For all vehicles**

**i Note**

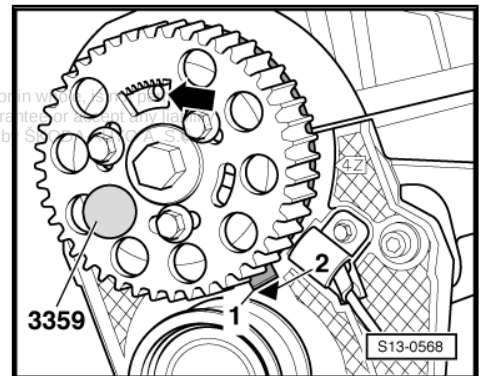
*Turn engine at hexagonal of central screw at front end of the crankshaft, if necessary using counterholder -T10172- or using counterholder -MP1-216 (3036)- at camshaft sprocket.*



- Rotate crankshaft to TDC for cylinder 1.
- The gear segment -arrow- must point upwards.
- The lug -1- on the wheel of the camshaft position sensor must be opposite the marking -2- on the rear toothed belt guard.

**i Note**

*To provide a clearer illustration, the camshaft sprocket is illustrated without the toothed belt.*



- Lock hub with rig pin -3359- .



- Depending on the version, lock the crankshaft timing belt sprocket with the crankshaft arrester -T10050- or crankshaft arrester -T10100-.

#### Version of the crankshaft timing belt sprocket:

A = original version of timing belt sprocket with circular tooth flank, rectangular marking for TDC at tooth in 12 o'clock position - use crankshaft arrester -T10050-

B = new version of timing belt sprocket with elliptical tooth flank, triangular marking for TDC at tooth opening in 1 o'clock position - use crankshaft arrester - T10100-



#### Note

- Markings on the timing belt gear and on the crankshaft arrester must be in line with each other -arrow-. Stud on the crankshaft arrester must engage into the hole in the sealing flange.
- The crankshaft arrester can only be fitted onto the timing belt gear from the front side of the serration.

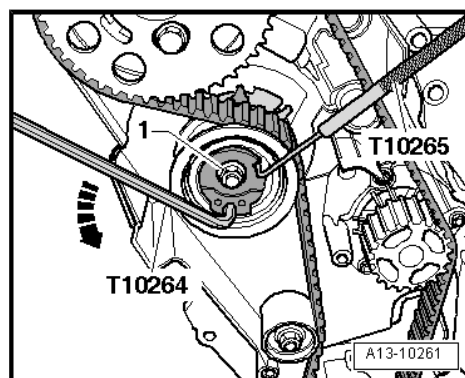
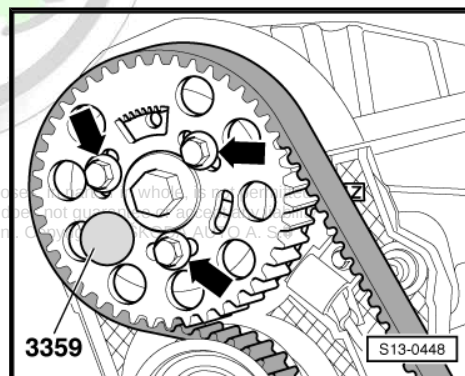
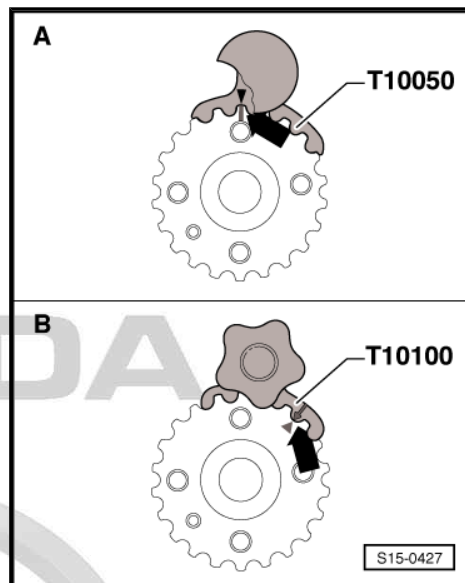


#### Note

Mark the direction of rotation of the toothed belt with chalk or a felt-tip pen.

- Slacken screws -arrows- of camshaft sprocket by one screw revolution.
- Loosen the fixing nut -1- of the tensioning pulley.

Protected by copyright. Copying for private or commercial purposes without the written permission of ŠKODA AUTO A. S. is prohibited. ŠKODA AUTO A. S. does not guarantee the correctness of information in this document.



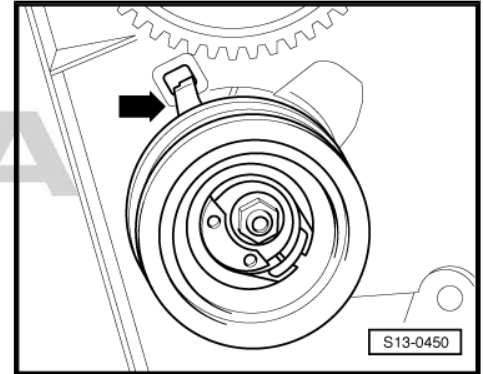
- Carefully turn eccentric of the tensioning pulley with offset screwdriver -T10264- in anti-clockwise direction -arrow- until the tensioning pulley can be interlocked with rig tool -T10265-.
- Now turn eccentric of the tensioning pulley clockwise -arrow- as far as the stop and tighten fixing nut -1- by hand.
- Remove guide pulley of toothed belt ➔ [Item 13 \(page 25\)](#).
- First of all take toothed belt off toothed belt sprocket of crankshaft and then from the other belt pulleys.

## 1.2.2 Installing (set the timing)

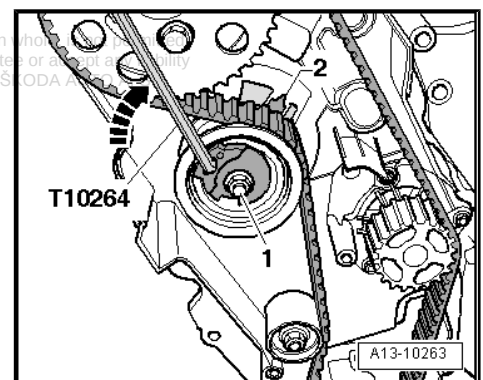
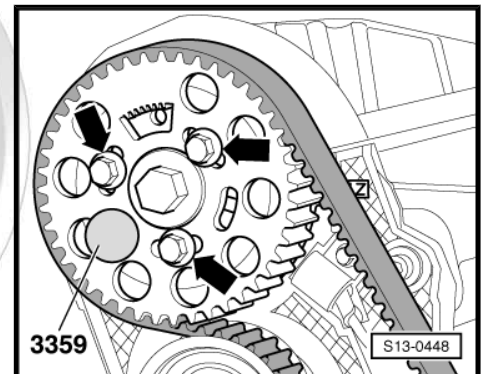
- Interlock camshaft with locking pin e. g. -3359-
- Interlock the crankshaft with the crankshaft arrester -T10050- or -T10100-.
- Interlock tensioning pulley in released position with fixing nut.

**i** Note

- ◆ *Always perform adjusting work on the timing belt only on a cold engine.*
- ◆ *When rotating the camshaft, the crankshaft must not be positioned at TDC for any one piston. Risk of damaging valves and pistons.*
- Check the correct fitting of the tensioning pulley in the hole in the rear timing belt guard -arrow-.



- Slightly screw in screws -arrows-.
- It must still be possible to turn the camshaft sprocket on the hub, however it must not hang loose.
- Turn camshaft sprocket clockwise in the elongated holes as far as the stop.
- Fit toothed belt onto crankshaft toothed belt sprocket, tensioning pulley, camshaft and, last of all, onto the toothed belt sprocket of the coolant pump.
- Install toothed belt guide pulley ⇒ [Item 13 \(page 25\)](#).
- Remove rig tool -T10265- from the tensioning pulley.
- Loosen the fixing nut -1- of the tensioning pulley.
- Turn the eccentric of the tensioning pulley with offset screwdriver -T10264- clockwise -arrow- in such a way until the pointer -2- stands in the centre of the base plate in the gap.



**i** Note

*Ensure that the fixing nut does not turn.*

- Hold the eccentric of the tensioning pulley in this position and tighten the fixing nut to 20 Nm and torque a further 45° (1/8 turn).

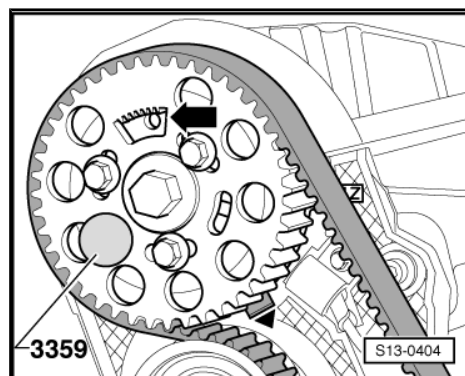
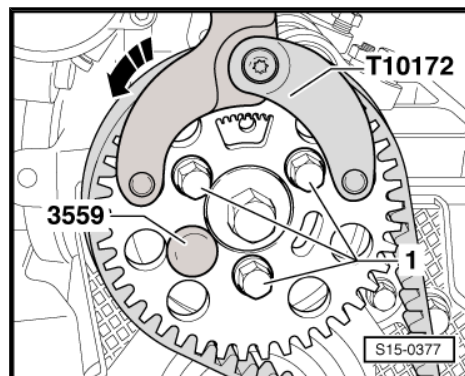
**i** Note

*When tightening the fixing nut, the pointer -arrow- turns max. 5 mm to the right from the gap of the base plate. This position must not be corrected, because the toothed belt settles when running-in.*

- Insert counterholder -T10172- with bolts -T10172/4- as shown and press in -direction of arrow-.
- Keep camshaft sprocket with counterholder -T10172- under tension and tighten screws -1- to 20 Nm + torque a further 45° (1/8 turn).
- Remove rig pin -3359- and crankshaft arrester -T10050- .

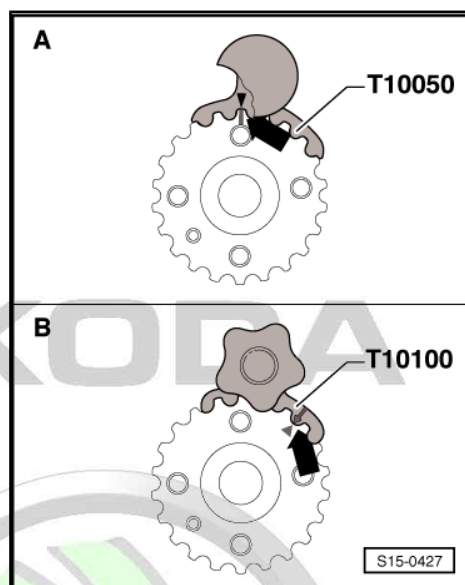
#### Test timing

- Turn crankshaft 2 turns in the direction of running of the engine until the crankshaft is positioned shortly before TDC for cylinder 1.
- Interlock during this motion the hub in the direction of running of the engine with locking pin -3359- .

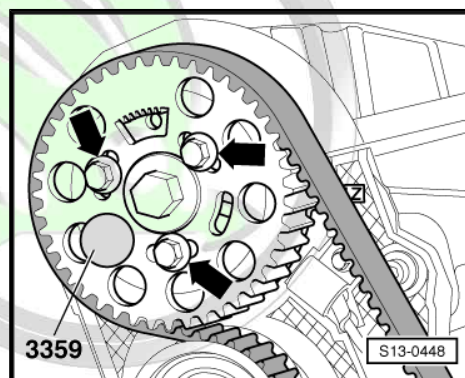


- Check whether:
  - ♦ the crankshaft can be interlocked with the crankshaft arrester -T10050- or crankshaft arrester -T10100- ;
  - ♦ The pointer of tensioning pulley stands in the centre or max. 5 mm to the right from the gap of the base plate.

#### If the crankshaft cannot be arrested



- Loosen bolts -arrows- of the camshaft timing gear.



- Rotate crankshaft in direction of rotation of engine until it can be arrested with the crankshaft arrester -T10050- or crankshaft arrester - T10100- .

**i Note**

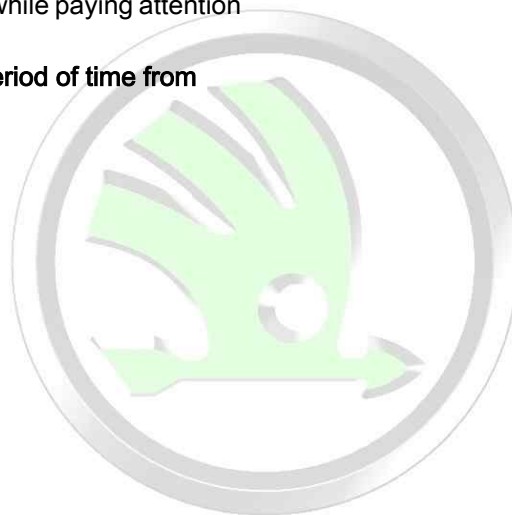
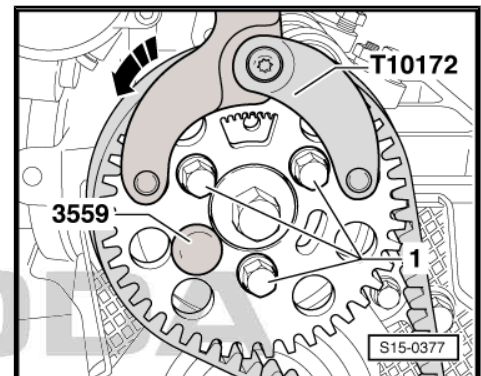
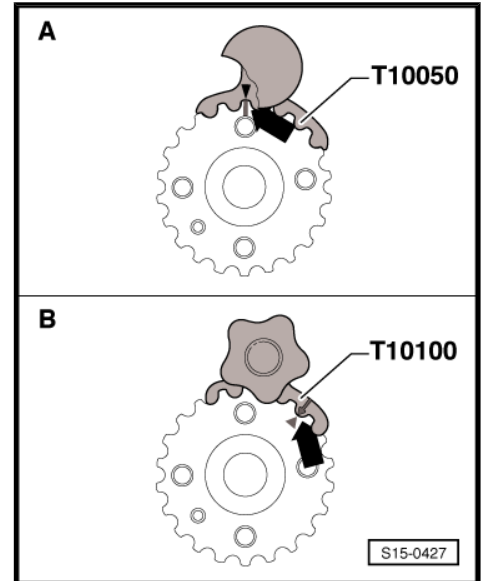
*If the crankshaft can be turned via the TDC for cylinder 1, turn crankshaft back slightly and once again set to the TDC for cylinder 1 by turning in direction of rotation of engine.*

- Insert counterholder -T10172- with bolts -T10172/4- as shown and press in -direction of arrow-.
- Keep camshaft sprocket with counterholder -T10172- under tension and tighten screws -1- to 20 Nm + torque a further 45° (1/8 turn).
- Remove rig pin -3359- and crankshaft arrester -T10050- or crankshaft arrester -T10100- .
- Turn crankshaft 2 turns in the direction of running of the engine until the crankshaft is again on TDC.
- Repeat timing test ➔ [page 32](#) .

**Proceed with installation**

Further installation occurs in reverse order, while paying attention to the following:

**Except vehicles manufactured during the period of time from 05.05 to 05.07**



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



- Install engine support. Screw in new screws -1 ... 3- by hand first, then tighten to 40 Nm + torque a further 90° (1/4 turn).

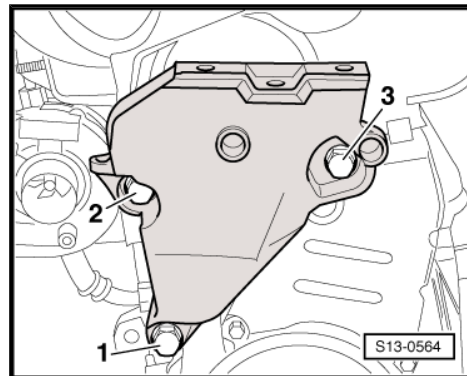
**Note**

*The engine support must be tightened up firmly before further installation of the right engine mounting.*

- Install and adjust the right engine mounting ⇒ [page 7](#) .

**For all vehicles**

- Install bottom and middle toothed belt guard.
- Install the V-ribbed belt and tensioning device.
- Install the V-ribbed belt ⇒ [page 21](#) .
- Install top toothed belt guard.
- Install charge air pipes and charge air hoses.
- ♦ Engine identification characters BJB, BKC, BXE:  
⇒ [page 157](#)
- ♦ Engine identification characters BLS: ⇒ [page 159](#)
- Install the front right wheelhouse liner ⇒ Body Work ⇒ Rep. Gr. 66 .
- Install fuel filter and coolant expansion reservoir.



# ŠKODA





## 2 Removing and installing sealing flange and flywheel

### 1 - Gasket ring

- ☐ replace ➔ [page 36](#)
- ☐ Neither oil nor grease

### 2 - Sealing flange on the belt pulley side

- ☐ must be positioned on dowel sleeves
- ☐ removing and installing ➔ [page 37](#)

### 3 - Cylinder block

- ☐ with fitted crankshaft
- ☐ Replace needle bearing for crankshaft ➔ [page 47](#)

### 4 - The two-mass flywheel

- ☐ removing and installing ➔ [page 45](#)
- ☐ Assembly is only possible in one position through offset holes.

### 5 - 60 Nm + torque a further 90° (1/4 turn)

- ☐ replace

### 6 - Intermediate plate

- ☐ must be positioned on dowel sleeves
- ☐ do not damage/bend during assembly work
- ☐ inserted on sealing flange ➔ [page 36](#)

### 7 - 15 Nm

- ☐ replace

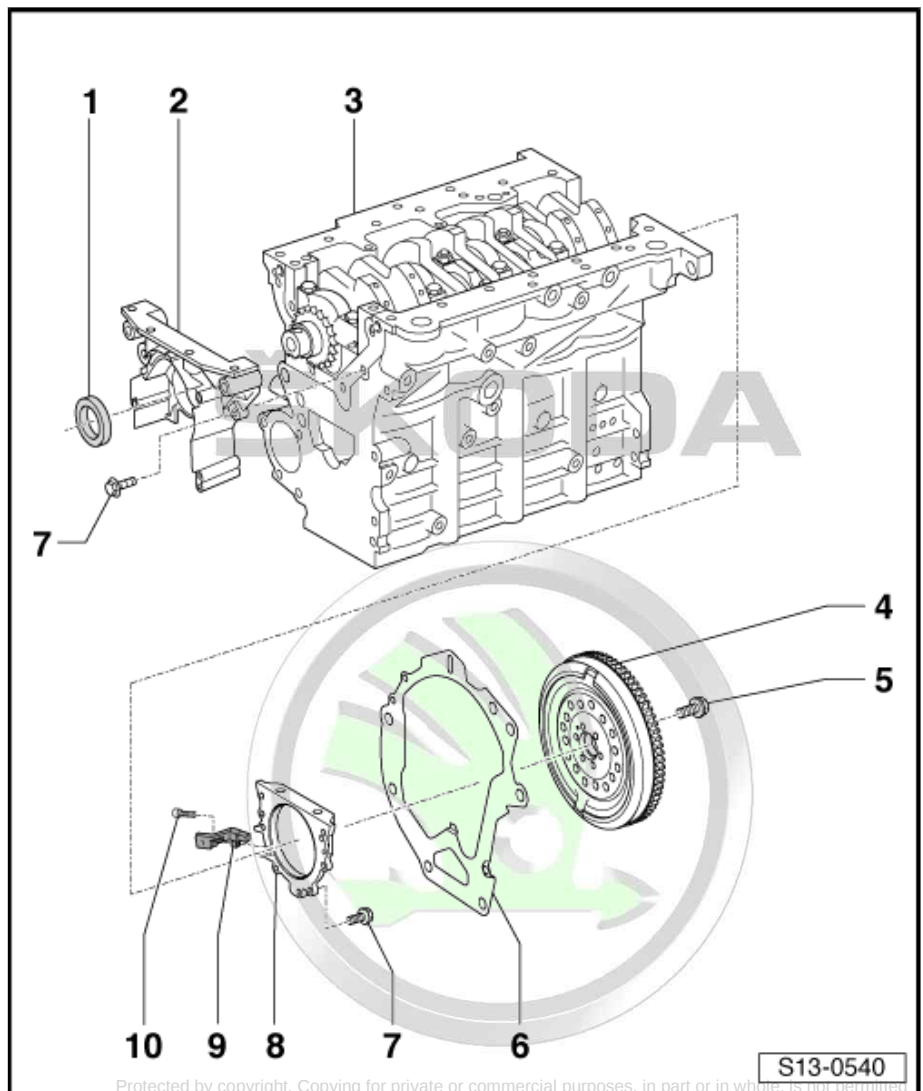
### 8 - Sealing flange on the gearbox side

- ☐ Always replace complete with gasket ring and if possible with rotor of engine speed sender -G28-
- ☐ replace ➔ [page 39](#)

### 9 - Engine speed sender -G28-

- ☐ removing and installing ➔ [page 181](#)

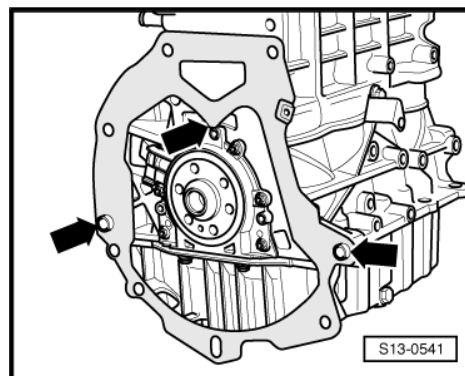
### 10 - 5 Nm



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

## Installing intermediate plate

- Insert intermediate plate on sealing flange and push onto the dowel sleeves -arrows-.



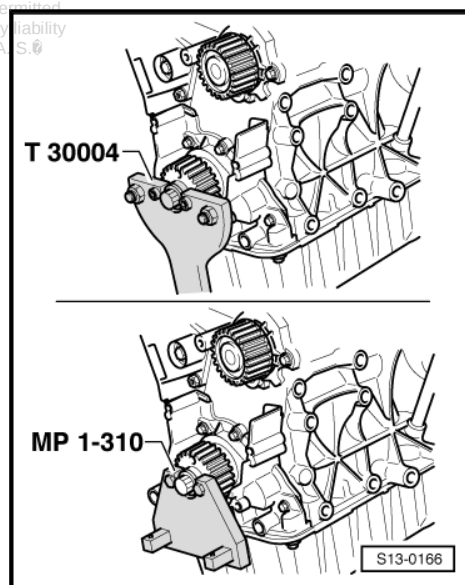
## 2.1 Replacing crankshaft seal on belt pulley side

### Special tools and workshop equipment required

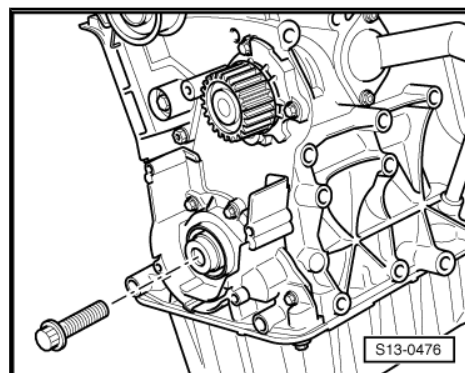
- ◆ Counterholder -T30004 (3415)- or Counterholder -MP1-310 (3099)-
- ◆ Gasket ring extractor -MP1-226 (3203)-
- ◆ Assembly device -T10053-

### Removing

- Engine installed.
- Removing toothed belt ⇒ [page 24](#).
- Remove crankshaft timing belt sprocket, to this end lock the timing belt sprocket with counterholder or counterholder for timing belt sprocket.



- Before inserting the gasket ring extractor, screw the central bolt of the timing belt sprocket into the crankshaft by hand up to the stop.
- Unscrew inner part of the gasket ring extractor -MP1-226 (3203)- two turns (approx. 3 mm) out of the outer part and lock with knurled screw.



- Oil the thread head of the gasket ring extractor, position and forcibly screw into the gasket ring as far as possible.
- Release knurled screw and turn the inner side against the crankshaft until the gasket ring is pulled out.
- Clamp gasket ring extractor into the vice and remove gasket ring with pliers.
- Clean the contact and sealing surface.

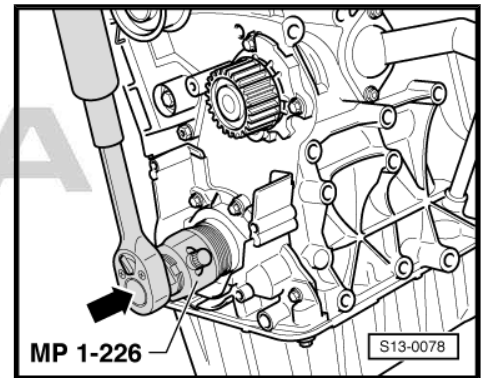
#### Install



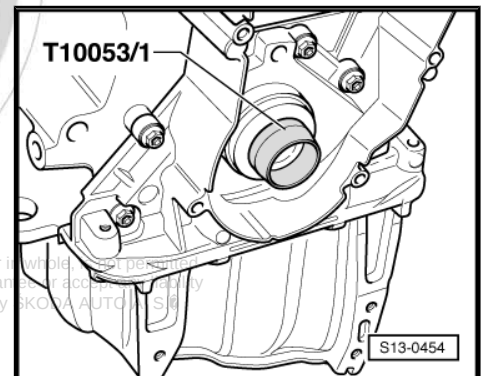
#### Note

*Do not oil the sealing lip and the outer surface of the gasket before the pressing in procedure.*

- Remove oil residue on the crankshaft stub with a clean cloth.
- Install -T10053/1- guide bushing on the crankshaft stub.
- Slide gasket ring over the guide bushing.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is prohibited unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee the accuracy of the information with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

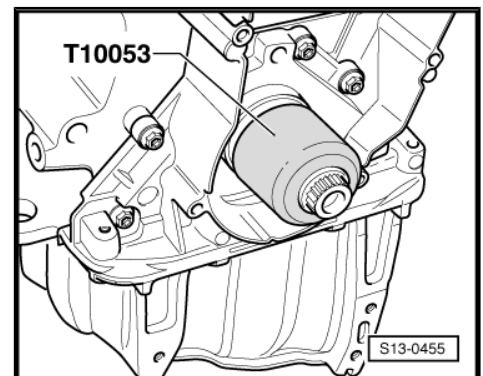


- Press in the gasket ring flush with the central screw for toothed belt sprocket and with pressure bushing of -T10053-.



#### Note

- ◆ *There must not be any oil present on contact surface between toothed belt sprocket and crankshaft.*
- ◆ *Replace central screw for toothed belt gear.*
- ◆ *Do no oil central screw for toothed belt sprocket.*
- Install crankshaft timing belt sprocket, to this end lock the timing belt sprocket with counterholder or counterholder for timing belt sprocket.
- install (set the timing) ⇒ [page 24](#) .
- Install the V-ribbed belt ⇒ [page 21](#) .



## 2.2 Removing and installing the sealing flange on the belt pulley side

### Special tools and workshop equipment required

- ◆ Counterholder -T30004 (3415)- or Counterholder -MP1-310 (3099)-
- ◆ Assembly device -T10053-
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.

- ◆ Cleaning and degreasing agent , e.g. -D 000 401 04-
- ◆ Protective goggles and gloves
- ◆ Silicone sealant -D 176 404 A2-

### Removing

- Engine installed.
- Removing toothed belt ⇒ [page 24](#)
- Remove crankshaft timing belt sprocket, to this end lock the timing belt sprocket with counterholder or counterholder for timing belt sprocket.
- Drain engine oil ⇒ Maintenance ; Octavia II .
- Removing the oil pan ⇒ [page 90](#) .
- Unscrew the fixing screws of the sealing flange and remove sealing flange, if necessary release by applying slight blows with a rubber-headed hammer.

### Install

Installation is performed in the reverse order, pay attention to the following points:



#### WARNING

*Use protective gloves and protective goggles when working with sealant and grease remover!*

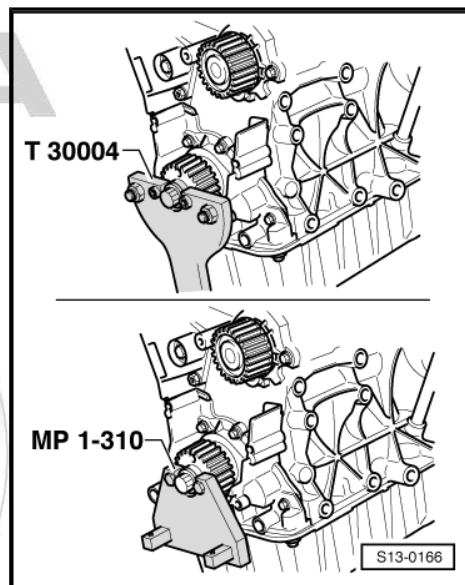
- Clear sealing surface on sealing flange, cylinder block and on the oil pan from gasket residues with chemical sealant remover.
- Degrease the sealing surfaces.



#### Note

*Pay attention to the use by date on the silicone sealant.*

- Cut off nozzle tube at the front marking (Ø of nozzle approx. 3 mm).

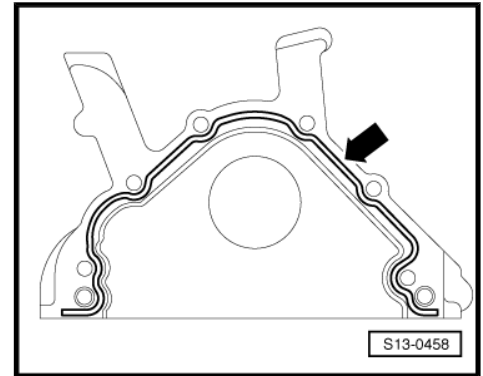


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

- Apply silicone sealant bead -arrow- to the clean sealing surface of the upper part of the sealing flange, as shown.
- Thickness of sealant bead -arrow-: 2 ... 3 mm.

**i Note**

- ◆ *The sealant bead must not be thicker than 3 mm otherwise excess sealant may get into the oil pan and clogg the strainer in the oil suction pipe.*
- ◆ *The sealing flange must be installed within 5 minutes after applying the silicone sealant.*
- ◆ *When installing the sealing flange with the gasket ring fitted, place a guide sleeve -T10053/1- on the crankshaft journal.*



- Carefully push the sealing flange onto the dowel sleeves at the cylinder block and tighten new fixing bolts by hand.
- Tighten the screws of the sealing flange alternately and cross-wise.
- Installing the oil pan ⇒ [page 90](#) .
- Install crankshaft timing belt sprocket, to this end lock the timing belt sprocket with counterholder or counterholder for timing belt sprocket.
- install (set the timing) ⇒ [page 24](#) .
- Install the V-ribbed belt ⇒ [page 21](#) .
- Top up with engine oil and check the oil level ⇒ Maintenance ; Octavia II .

## 2.3 Replace sealing flange on the gearbox side

### Special tools and workshop equipment required

- ◆ Assembly device -T10134-
- ◆ Screw M6x35 (3x)
- ◆ Screw M7x35 (2x)
- ◆ Feeler gauges
- ◆ Steel straightedge

### 2.3.1 Removing

**i Note**

*In order to better represent the work sequences, these sequences are performed with the engine removed. The work sequences are identical with the engine installed and gearbox removed.*

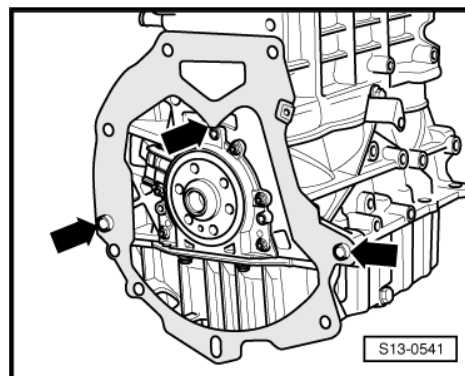
- Remove the two-mass flywheel ⇒ [page 45](#) .

ŠKODA

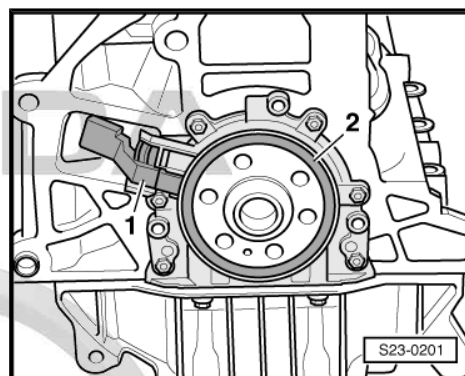




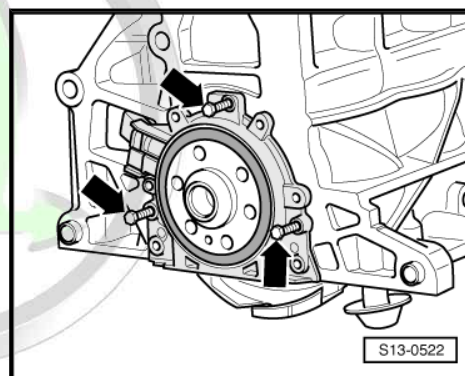
- Remove the intermediate plate from the dowel sleeves and unhook from sealing flange -arrows-.
- Position engine on TDC cylinder 1 ➔ [page 24](#) .



- Remove engine speed sender -G28- -Pos. 1-.
- Removing the oil pan ➔ [page 90](#) .
- Release the fixing screws of the sealing flange.



- Screw 3 screws M6x35 into the threaded bores of the sealing flange -arrows-.
- Press out sealing flange together with rotor from the crankshaft by alternately screwing the screws into the sealing flange.



#### Note

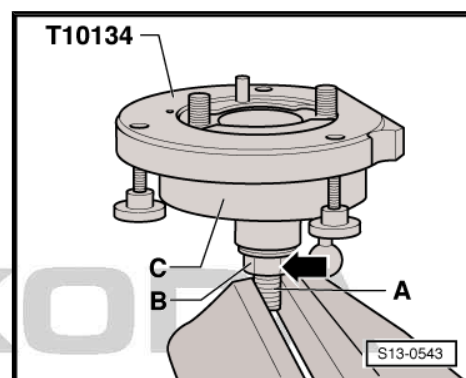
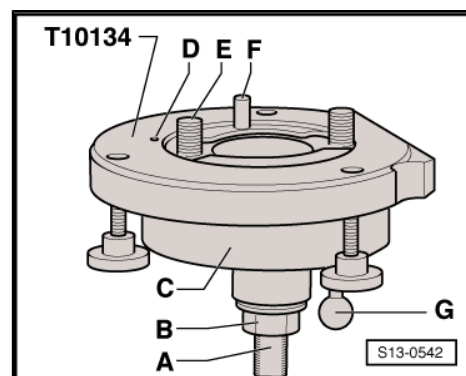
- ◆ The sealing flange with PTFE gasket ring is provided with sealing lip supporting ring. This supporting ring is intended as an assembly sleeve and must not be removed before installing.
- ◆ Do not separate or turn the sealing flange and rotor after removing them from the spare part package.
- ◆ The rotor is given its fitting location by fixing the assembly device to the positioning pin -T10134- .
- ◆ The sealing flange and gasket ring form one unit and must be replaced together with the rotor.
- ◆ The rotor has an elastomer layer on its sealing surface with the crankshaft. This layer must not be brought into contact with dirt or grease.
- ◆ The assembly device -T10134- is given its fitting location to the crankshaft by means of a guide bolt, which is guided into the threaded bore of the crankshaft.

## 2.3.2 Install

### A - Mounting the sealing flange with rotor on the assembly device -T10134-

- A - Clamping surface
- B - Hexagon nut
- C - Assembly cup
- D - Positioning pin
- E - Allen screw
- F - Guide bolt for diesel engines (black handle)
- G - Guide bolt for petrol engines (red handle)

- Tighten assembly device -T10134- on the clamping surface -A- of the threaded spindle in a vice.

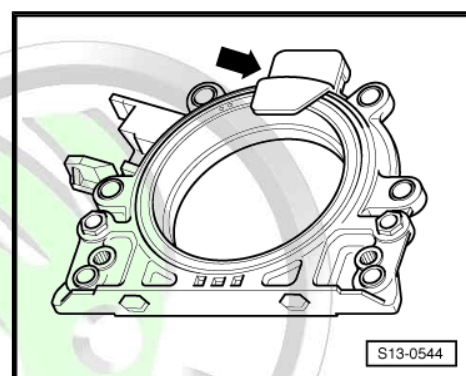


- Remove the securing clip -arrow- from the new sealing flange.

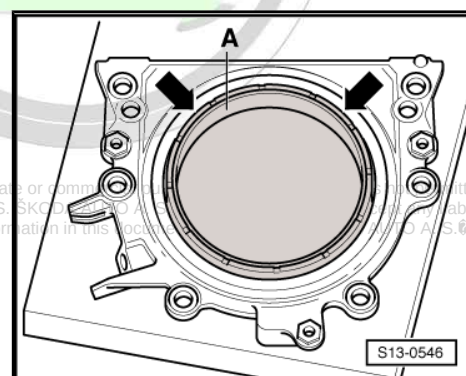


#### Note

*Do not remove or turn the rotor from the sealing flange.*



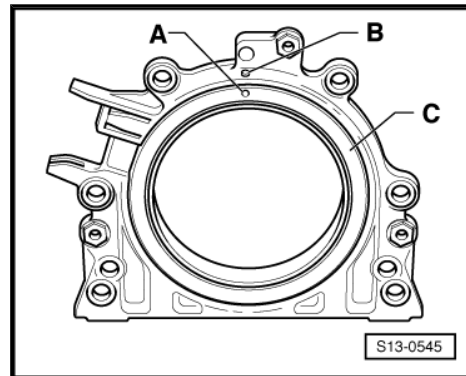
- Lay the front side of the sealing flange on a clean and level surface.
- Press the sealing lip supporting ring -A- -arrows-, until it rests on the level surface.



Protected by copyright. Copying for private or commercial use without the written permission of ŠKODA AUTO A. S. is prohibited. ŠKODA AUTO A. S. is not responsible for the correctness of information in this document.



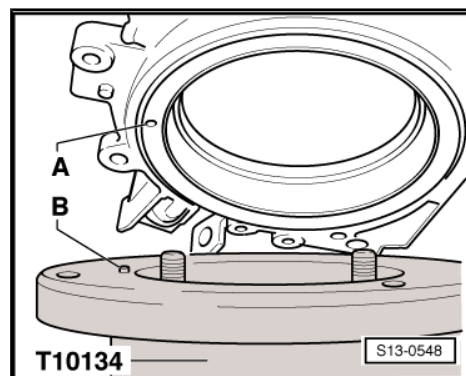
- Locating hole -A- on the rotor -C- must be flush with the marking -B- on the sealing flange.



- Lay the sealing flange with the front side on the assembly device - T10134- in such a way that the positioning pin -B- engages in the hole -A- of the rotor.

**Note**

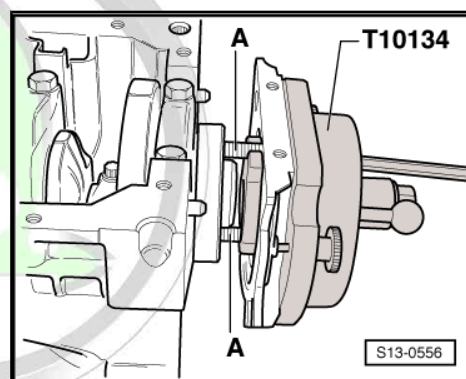
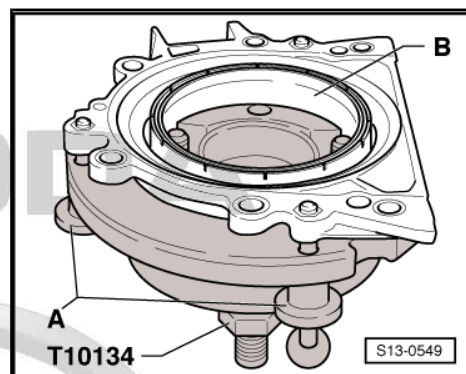
*Make sure the sealing flange lies flat on the assembly device.*



- When tightening the knurled screws -A- press the sealing flange and sealing lip supporting ring -B- on the surface of the assembly device in such a way that the positioning pin can no longer slide out of the rotor hole.

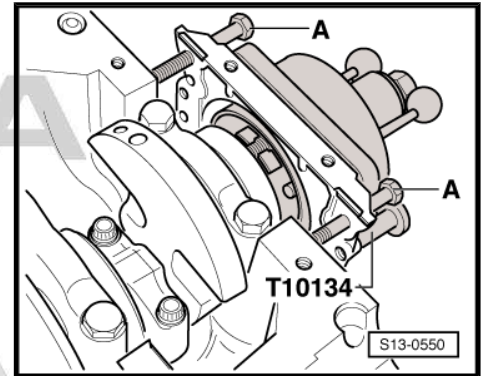
**B - Mounting the assembly device -T10134- with sealing flange on the crankshaft flange:**

- The crankshaft flange must be free of grease and oil
- The engine is at TDC for cylinder 1
- Unscrew hexagon nut up to the end of the threaded spindle.
- Screw assembly device with Allan screws -A- onto the crankshaft flange up to the stop.

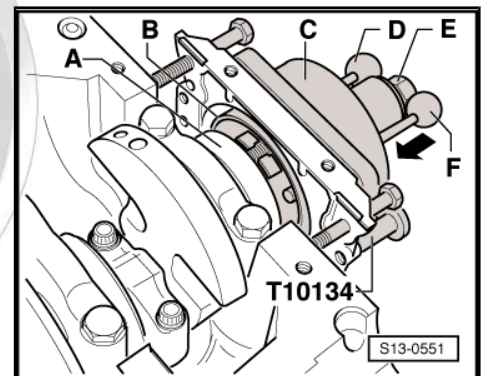


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

- Screw two screws M7 x 35 mm -A- for guiding the sealing flange into the cylinder block by about 3 turns.



- Move the assembly cup -C- by hand in the -direction of the arrow- until the rotor -B- rests on the crankshaft flange -A-. Then insert the guide bolt with red ball -D- fully into the threaded bore of the crankshaft. If the guide bolt is correctly seated, the ball is approx. 10 mm from the assembly cup -C-. This gives the rotor its final fitting location.
- Screw in hexagon nut -E- by hand onto the threaded spindle until it rests against the assembly cup -C-.



**i Note**

*The guide bolt for petrol engines (red handle) -F- must not be fitted into the threaded hole of the crankshaft.*

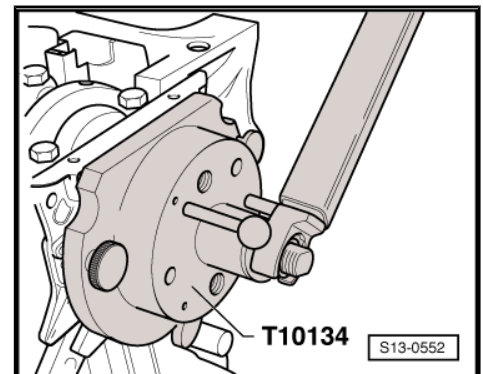
for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

**C - Pressing the rotor onto the crankshaft flange:**

- Tighten the hexagon nut of the assembly device using a torque wrench with adapter. Tightening torque: 35 Nm.

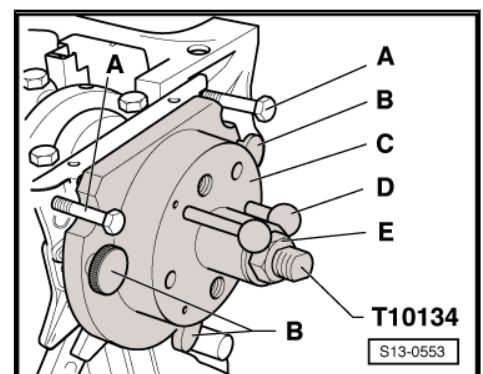
**i Note**

*After tightening the nut to 35 mm there must still be a narrow air gap between the cylinder block and the sealing flange.*



**D - Inspecting the fitting position of the rotor on the crankshaft:**

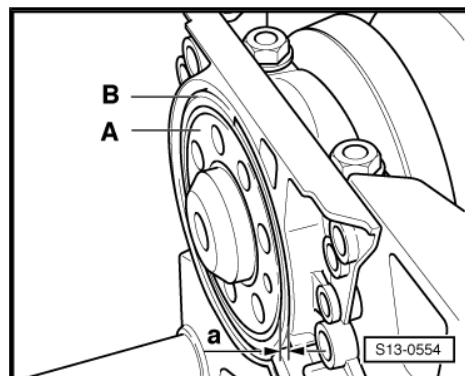
- Screw in hexagon nut -E- up to the end of the threaded spindle.
- Release 2 screws -A- to the guide from the cylinder block.
- Release the 3 knurled screws -B- from the sealing flange.
- Unscrew two Allan screws and remove assembly device.
- Remove sealing lips supporting ring.







- The fitting position of the rotor on the crankshaft is accurate if there is a distance -a- = 0.5 mm between the crankshaft flange -A- and the rotor -B-.



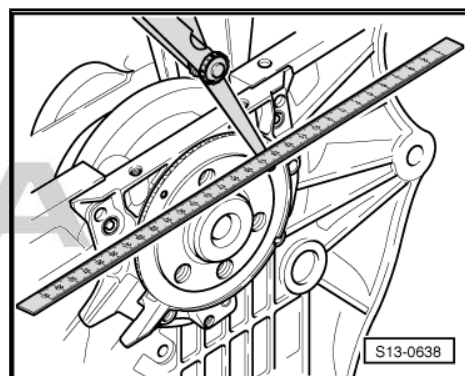
- Position the steel straightedge onto the crankshaft flange.
- Measure the distance between the steel straightedge and the rotor with a feeler gauge.

If the measured distance is below 0.5 mm:

- Press down rotor ➔ [page 44](#).

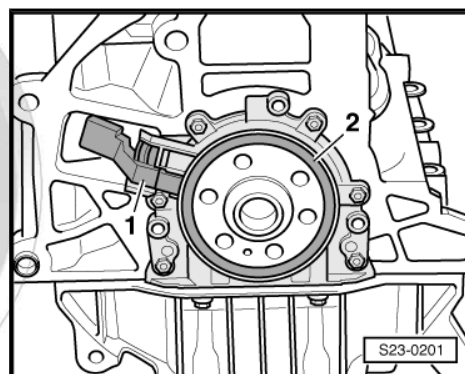
If the dimension is correct:

- Tighten the new fixing screws of the sealing flange crosswise. Tightening torque: 15 Nm.



- Install engine speed sender -G28- -Pos. 1-.

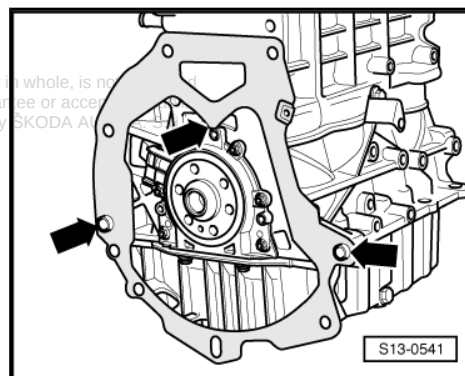
- Installing the oil pan ➔ [page 90](#).



- Insert intermediate plate on sealing flange and push onto the dowel sleeves -arrows-.

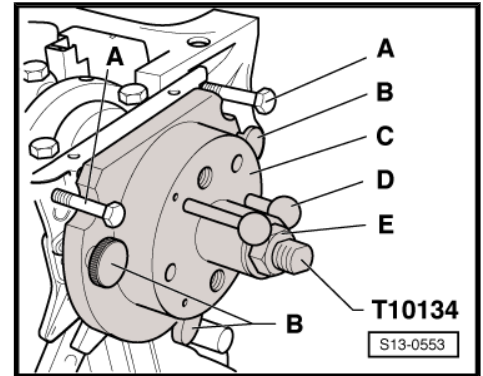
- Install the two-mass flywheel ➔ [page 45](#).

#### E - Pressing down the rotor:





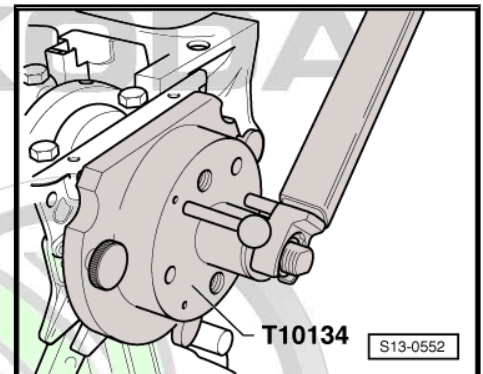
- Screw assembly device -T 10134- with Allan screws up to the stop onto the crankshaft flange.
- Screw in three knurled screws -B- into the flange.
- Then insert the guide bolt with red ball -D- fully into the threaded bore of the crankshaft. If the guide bolt is correctly seated, the ball is approx. 10 mm from the assembly cup -C-.
- Screw in hexagon nut -E- by hand onto the threaded spindle until it rests against the assembly cup -C-.



- Tighten the hexagon nut of the assembly device using a torque wrench with adapter. Tightening torque: 40 Nm.
- Again inspect the fitting position of the rotor on the crankshaft ➤ [page 43](#) .

If the dimension -a- is again too small:

- Tighten the hexagon nut of the assembly device to 45 Nm.
- Again inspect the fitting position of the rotor on the crankshaft ➤ [page 43](#) .



## 2.4 Removing and installing the two-mass flywheel

### Special tools and workshop equipment required

- ◆ Counterholder -MP1-223 (3067)-
- or
- ◆ Engine mount -MP 1-202 (VW 540)-
- ◆ Bushing -T30010 (VW 540/1B)-
- ◆ Flywheel lock -MP 1-504 -

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

### Removing

- Gearbox is removed.

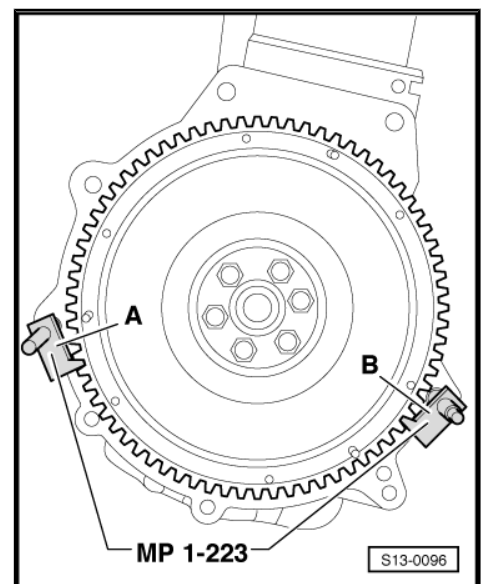
### Engine installed

- Insert the counterholder -MP1-223 (3067)- into the bore hole on the cylinder block.

- Fitting position of the tool:

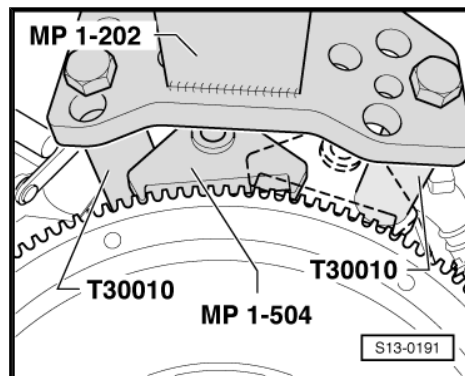
A - for tightening

B - for slackening



## Engine removed

- Position the flywheel lock -MP 1-504- on the ring gear and turn crankshaft until it rests against the bushing -T30010- .



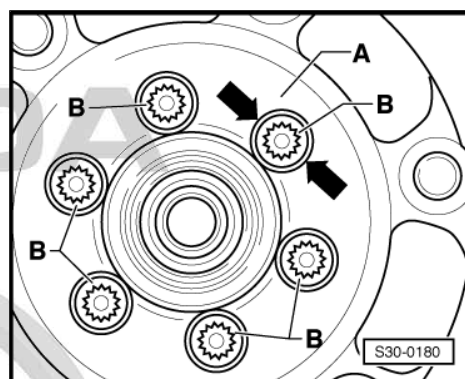
## Continued for all

- Rotate the secondary side -A- of the two-mass flywheel in such a way that the screws -B- are positioned in the middle of the holes -arrows-.



### Caution

*When unscrewing the screws -B-, ensure that the screw head does not jam on the secondary side -A- of the two-mass flywheel, otherwise the flywheel will be damaged.*



- Release screws -B- and remove the two-mass flywheel.

## Install

Installation occurs in reverse order to removal. Pay attention to the following:

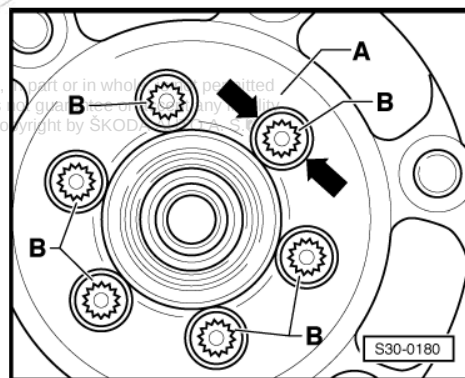


### Note

*Use new screws for attaching.*

- Rotate the secondary side -A- of the two-mass flywheel in such a way that the screws -B- are positioned in the middle of the holes -arrows-.

- Screw in all the screws -B- by hand.
- First of all tighten all the screws -B- crosswise to 60 Nm.
- Then torque all the screws -B- crosswise a further 90° (1/4 turn.)



## 3 Crankshaft, Piston and Conrod

### 3.1 Removing and installing crankshaft



*The engine should be attached to the engine repair stand with engine holder -MP 1-202- for carrying out removal and installation work.*

#### 1 - Bearing shells 1, 2, 4 and 5

- ☐ for cylinder block with lubricating groove
- ☐ for bearing cap without lubricating groove
- ☐ do not mix up used bearing shells (mark)

#### 2 - 65 Nm + torque a further 90° (1/4 turn)

- ☐ replace

#### 3 - Bearing caps

- ☐ Bearing cap 1: belt pulley side
- ☐ bearing cap 3 with recesses for thrust washers
- ☐ retaining lugs of the bearing shells of the cylinder block/bearing cap must be on top of one another

#### 4 - Thrust washers

- ☐ for bearing cap 3
- ☐ pay attention to locating element

#### 5 - Needle bearing

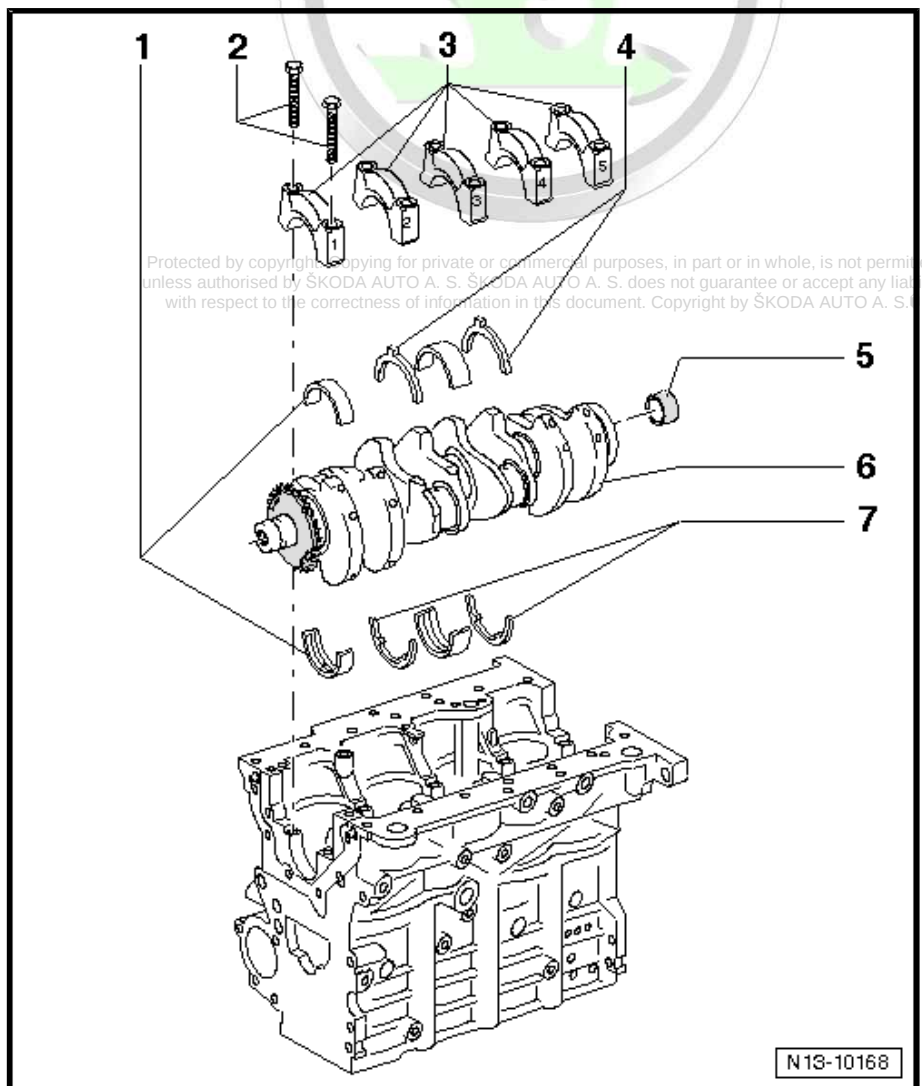
- ☐ only vehicles with automatic gearbox 02E
- ☐ replace ⇒ [page 47](#)

#### 6 - Crankshaft

- ☐ with chain sprocket for oil pump drive
- ☐ Axial play when new: 0.07 ... 0.17 mm; Wear limit: 0.37 mm
- ☐ Crankshaft bearing journal: Ø 54.00 mm
- ☐ Conrod bearing journal: Ø 50.90 mm

#### 7 - Thrust washers

- ☐ for cylinder block, bearing 3



N13-10168

### 3.2 Replace needle bearing for crankshaft

Only on vehicles fitted with automatic gearbox.

### Special tools and workshop equipment required

- ◆ Interior extractor -Kukko 21/2 -
- ◆ Countersupport -Kukko 22/1-
- ◆ Centering mandrel -T30029 (3176) -



#### Note

*For installing the engine for vehicles with automatic gearbox, check whether the needle bearing is built into the crankshaft. Install the needle bearing as required.*

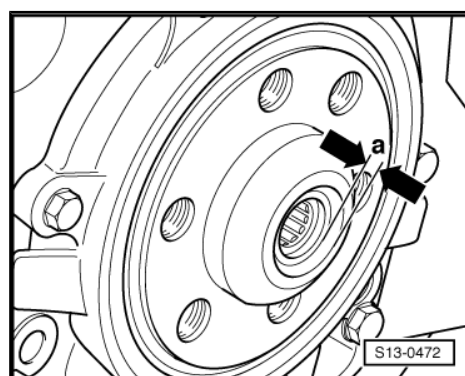
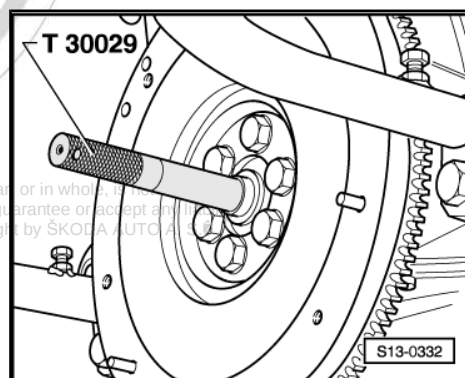
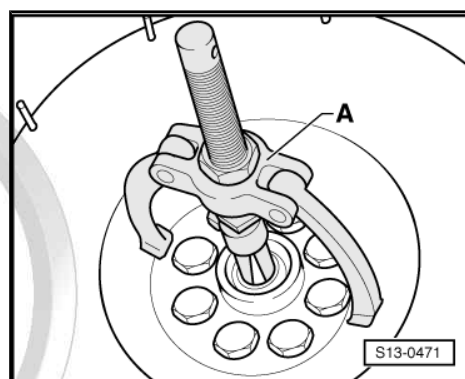
### Removing

- Pull out e.g. Kukko 21/2 and Kukko 22/1 with interior extractor with support -A-.

### Install

Fitting position of the needle bearing:

- ◆ The marked side of the needle bearing should be visible when in its installed condition.
- Insert into the crankshaft with the centering pin -T30029 (3176)- .
- The marked side of the needle bearing (gasket ring side) should be legible when in its installed condition.



Depth of installation of the needle bearing:

- ◆ Dimension a = 1.5 mm... 1.8 mm.

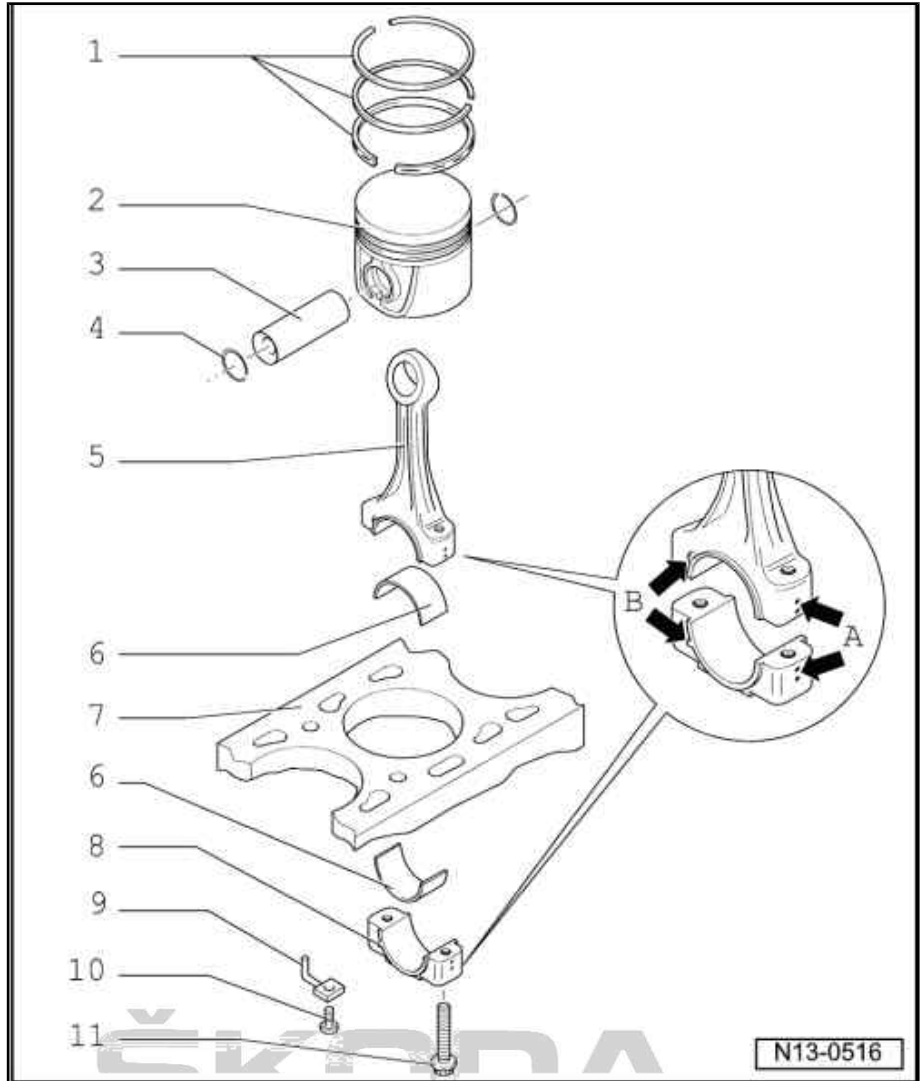
## 3.3 Disassembling and assembling piston and conrod

### 1 - Piston rings

- ☐ Offset joint 120°
- ☐ use piston ring pliers for removing and installing
- ☐ marking "TOP" faces piston crown
- ☐ Inspect gap clearance  
⇒ [page 50](#)
- ☐ Inspect end clearance  
⇒ [page 50](#)

### 2 - Piston

- ☐ with combustion chamber
- ☐ with oil labyrinth for cooling
- ☐ mark installation position and matching cylinder
- ☐ Installation position and assignment of piston/cylinder ⇒ [page 51](#)
- ☐ arrow on piston crown faces towards the belt pulley side
- ☐ replace piston if there is any sign of crack formation on the piston body
- ☐ Inspecting piston  
⇒ [page 51](#)
- ☐ Piston: Ø 79.47 mm
- ☐ use piston ring tensioning strap for installing
- ☐ inspect piston projection at TDC ⇒ [page 52](#)



### 3 - Piston pin

- ☐ if stiff, heat piston to approx. 60°C
- ☐ with drift -VW 222A- removing and installing

### 4 - Circlip

### 5 - Conrod

- ☐ always replace as a set only
- ☐ mark matching cylinder -A-
- ☐ Fitting position: Markings -B- point towards the belt pulley side
- ☐ with a split bearing cap
- ☐ separate new conrod ⇒ [page 53](#)

### 6 - Bearing shell

- ☐ Fitting position ⇒ [page 52](#)
- ☐ do not mix up used bearing shells (mark)
- ☐ Observe version: top bearing shell (towards the piston) must be made from a long lasting material, recognition feature for new bearing shells: black marking on the contact surface near the separation point
- ☐ insert in middle
- ☐ check for firm seating
- ☐ Axial play wear limit: 0.37 mm

### 7 - Cylinder block

- ☐ inspect cylinder bore ⇒ [page 52](#)

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted without the written authorisation of ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©





- ☐ Cylinder:  $\varnothing$  79.51 mm

#### 8 - Conrod cap

- ☐ Check fitting position
- ☐ cracked cover fits only in one position at the relevant conrod.

#### 9 - Oil injection nozzle

- ☐ for piston cooling

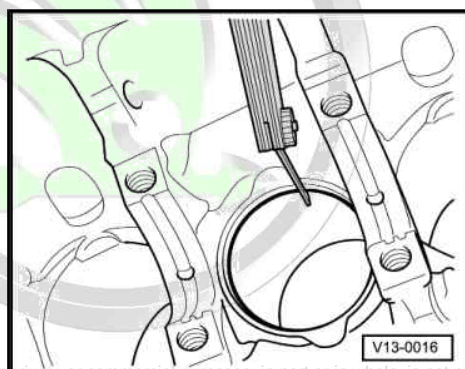
#### 10 - 25 Nm

- ☐ replace without sealant

#### 11 - Conrod bolt - 30 Nm + torque a further + 90° (1/4 turn)

- ☐ replace
- ☐ oil thread and head contact surface

### Inspecting piston ring gap clearance



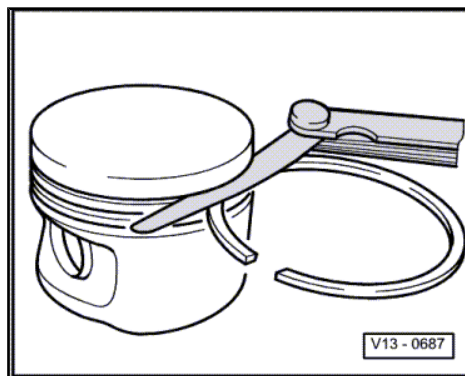
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

### Special tools and workshop equipment required

- ◆ Feeler gauge
- Insert ring at right angles from above down into lower cylinder opening, about 15 mm away from edge of cylinder. To insert use piston without rings.

| Piston ring<br>(dimensions in mm) | new           | Wear limit |
|-----------------------------------|---------------|------------|
| 1. Compression ring               | 0,25 ... 0,40 | 1,00       |
| 2. Compression ring               | 0,25 ... 0,40 | 1,00       |
| Oil scraper ring                  | 0,25 ... 0,50 | 1,00       |

### Inspect piston ring end clearance

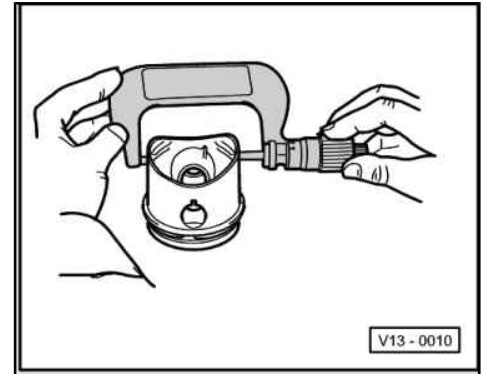


### Special tools and workshop equipment required

- ◆ Feeler gauge
- Clean before inspecting the annular grooves of the piston.

| Piston ring<br>(dimensions in mm) | new           | Wear limit |
|-----------------------------------|---------------|------------|
| 1. Compression ring               | 0,06 ... 0,09 | 0,25       |
| 2. Compression ring               | 0,05 ... 0,08 | 0,25       |
| Oil scraper ring                  | 0,03 ... 0,06 | 0,15       |

### Inspecting pistons



### Special tools and workshop equipment required

- ◆ External micrometer
- Measure about 10 mm from the lower edge, offset at right angles to the piston pin shaft.
- Max. deviation from specified dimension: 0.04 mm.

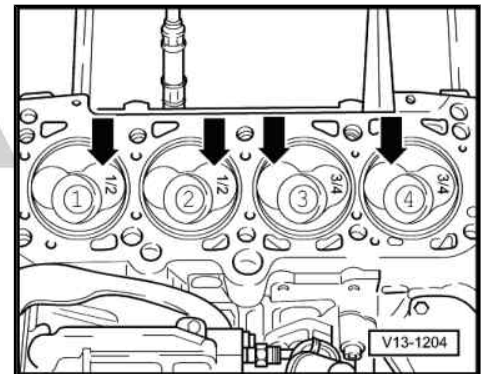
### Installation position and assignment of piston/cylinder

Pistons in cylinders 1 and 2:

- Large piston relief for inlet valve to flywheel side -arrows-.

Pistons in cylinders 3 and 4:

- Large piston relief for inlet valve to belt pulley side -arrows-.

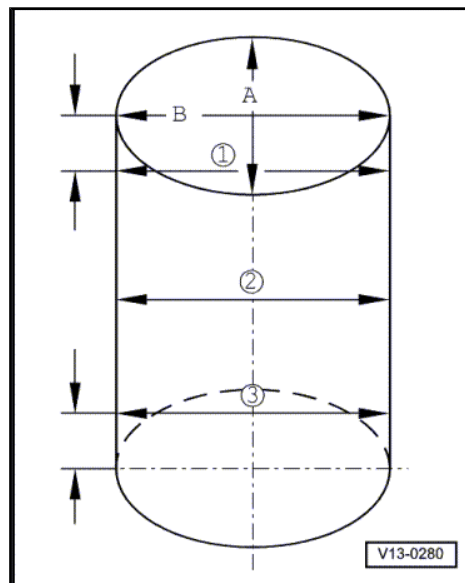


### Note

- ◆ For new pistons the cylinder assignment is colour-coded on the piston crown.
- ◆ Piston of cylinder 1 and 2: Marking 1/2.
- ◆ Piston of cylinder 3 and 4: Marking 3/4.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## Inspecting cylinder bore

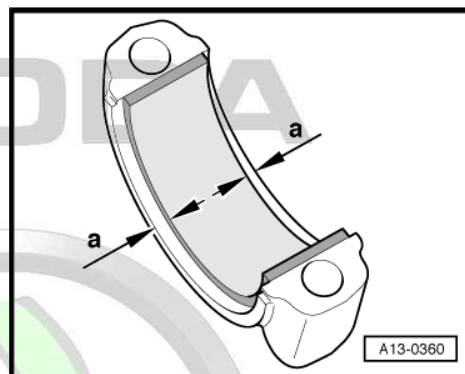


### Special tools and workshop equipment required

- ◆ Internal precision measuring instrument
- Measure cylinder at 3 points crosswise in transverse direction -A- and lengthwise -B-.
- Max. deviation from specified dimension: 0.10 mm.

### Fitting position of the bearing shells in the conrods

- Insert bearing shell in the conrod or in the centre of the conrod bearing cap.
- Dimension -a- = 2.5 mm



## 3.4 Checking piston projection in TDC

### Special tools and workshop equipment required

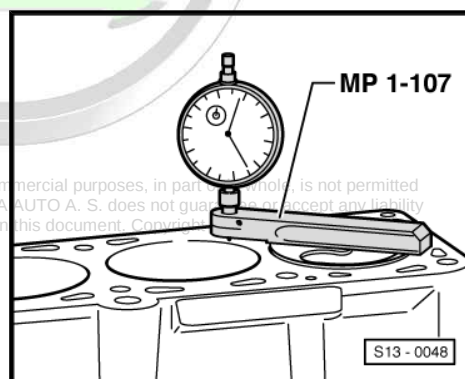
- ◆ Measuring tool for liner pretension -MP1-107-

### Test sequence

When fitting new pistons or a partial engine, check the piston projection in TDC on all pistons.

Depending on the piston projection fit the relevant cylinder head seal in accordance with the table below:

| Piston projection over cylinder block - top side<br>mm | Bore marking |
|--------------------------------------------------------|--------------|
| 0,91 ... 1,00                                          | 1            |
| 1,01 ... 1,10                                          | 2            |
| 1,11 ... 1,20                                          | 3            |



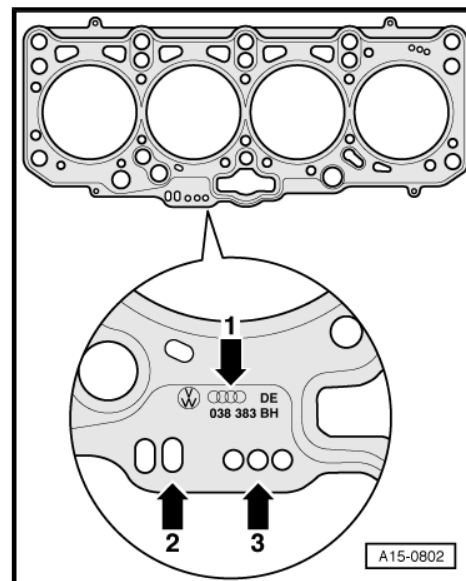
### Identification of the cylinder head seal

- ◆ Spare parts No. = -arrow 1-
- ◆ Control code = -arrow 2- (ignore)
- ◆ Bores = -arrow 3-



#### Note

*If different values are measured during the projection measurement of the piston, the greatest dimension applies for the seal assignment.*



## 3.5 Separate new conrod

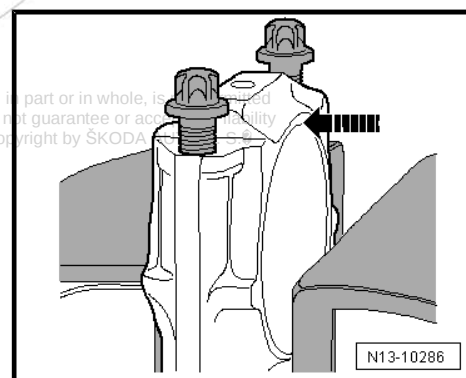
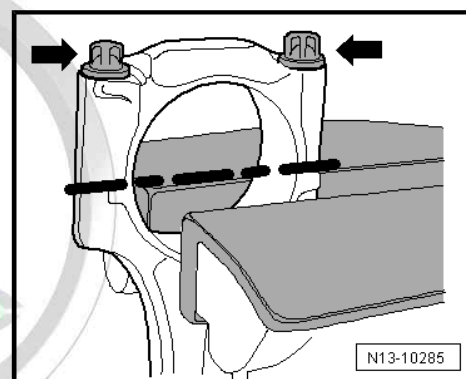
It can happen that on new conrods, the provided separation point is not completely cracked. If the conrod cap cannot be removed by hand, then proceed as follows:

- Mark the assignment of the conrod to the cylinder.
- Slightly tension the conrod in a vice provided with aluminium protective jaws, as shown in the illustration.



#### Note

- ◆ *Only tension the conrod slightly in order to avoid damage.*
- ◆ *The conrod is clamped beyond the broken line.*
- Unscrew both screws -arrows- by approx. 5 turns.
- Carefully knock on the conrod cap with a rubber hammer in -direction of arrow- in order to loosen the cover.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is prohibited unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.



## 15 – Cylinder Head, Valve Gear

### 1 Removing and installing cylinder head



#### Note

- ◆ *Cylinder heads with cracks between the valve seats may continue to be used without any reduction in the life time provided the cracks are slight and max. 0.5 mm wide.*
- ◆ *It is not permissible to rework the cylinder heads of diesel engines.*
- ◆ *Replace cylinder head bolts.*
- ◆ *When undertaking assembly replace self-locking nuts, which have been tightened to a turning angle, as well as gasket rings and gaskets.*
- ◆ *When installing an exchange cylinder head with the camshaft installed, it is necessary to oil the contact surfaces between bucket tappets and the cam track after installing the cylinder head.*  
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for the use of the information in this manual.
- ◆ *Do not remove the plastic bases supplied as a protection for the open valves of an exchange cylinder head with installed camshaft until just before fitting on the cylinder head.*
- ◆ *When replacing the cylinder head, replace all the coolant.*
- ◆ *In case of contaminated engine oil, carry out oil change  
⇒ Maintenance ; Octavia II .*
- ◆ *Engine temperature should not exceed 35°, because the cylinder head could be twisted when slackening the screws.*

### 1.1 Summary of components

#### 1.1.1 Summary of components for engine with engine identification characters BJB, BKC, BXE



**1 - 10 Nm**

- ☐ mount using locking agent -D 000 600 A2-

**2 - 15 Nm**

**3 - 100 Nm**

- ☐ to release and tighten use the counterholder - T10051-

**4 - Hub**

- ☐ with sensor rotor for the Hall sensor -G40-
- ☐ to remove the extractor -T10052- use
- ☐ removing

**5 - Cylinder head**

- ☐ removing ⇒ [page 62](#)
- ☐ check for distortion ⇒ [page 56](#)
- ☐ installing ⇒ [page 67](#)
- ☐ after replacing fill entire system with fresh coolant

**6 - Cylinder head bolt**

- ☐ replace
- ☐ pay attention to order for slackening ⇒ [page 66](#)
- ☐ pay attention to order for tightening ⇒ [page 68](#)
- ☐ before installing, insert washers into the cylinder head

**7 - Gasket for cylinder head cover**

- ☐ replace if damaged or leaking
- ☐ before fitting, seal contact faces with sealant -D 454 300 A2- ⇒ [page 60](#)

**8 - Cylinder head cover**

- ☐ removing and installing ⇒ [page 59](#)

**9 - Gasket**

- ☐ replace if damaged or leaking

**10 - Intermediate flange**

**11 - Sealing sleeve**

**12 - Cap**

**13 - Gasket**

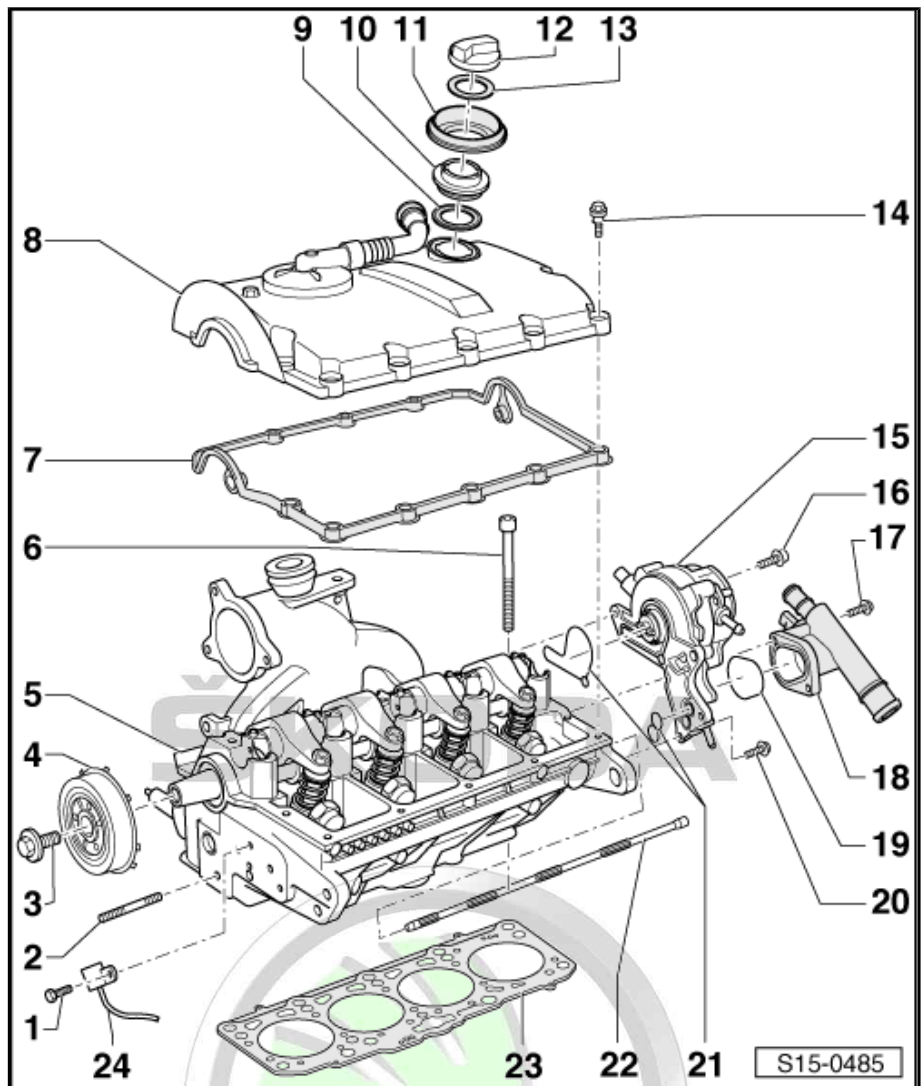
- ☐ replace if damaged or leaking

**14 - 10 Nm**

- ☐ pay attention to sequence for loosening and tightening ⇒ [page 59](#)

**15 - Tandem pump**

- ☐ removing and installing ⇒ [page 136](#)



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



16 - 20 Nm

17 - 10 Nm

18 - Coolant flange

19 - O-ring

- ☐ replace

20 - 10 Nm

21 - Gasket rings

- ☐ replace

22 - Mixing tube

- ☐ inserted into cylinder head
- ☐ pull out with hook

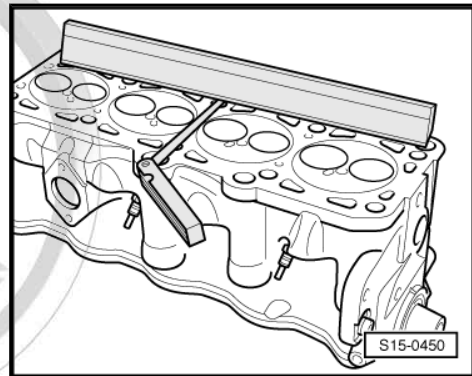
23 - Cylinder head gasket

- ☐ replace ⇒ [page 67](#)
- ☐ Pay attention to the marking ⇒ [page 57](#)

24 - Hall sender -G40-

- ☐ for camshaft position

Inspecting the cylinder head for distortion



### Special tools and workshop equipment required

- ◆ Feeler gauges
- ◆ Knife-edge straightedge
- Inspect cylinder head at several points for distortion using a knife-edge straightedge and feeler gauge.
- Max. permissible distortion: 0.1 mm.

**i Note**

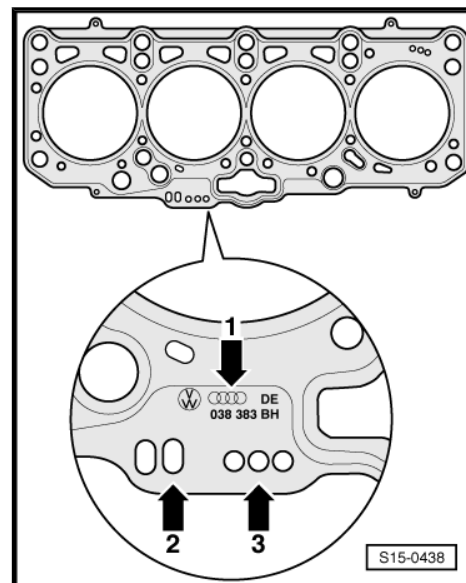
*It is not permissible to rework the cylinder heads of diesel engines.*

**Identification of the cylinder head seal**

- ◆ Spare parts No. = -arrow 1-
- ◆ Control code = -arrow 2- (ignore)
- ◆ Bores = -arrow 3-

**i Note**

*Differing thicknesses of cylinder head gaskets are inserted according to the piston projection. Only install a new gasket with the same identification markings if only replacing the gasket.*



## 1.1.2 Summary of components for engine with identification characters BLS

**1 - Vacuum hose**

- ☐ for connecting piece of tandem pump / brake booster

**2 - Cap**

**3 - Connecting tube**

- ☐ for crankcase ventilation
- ☐ To intake hose

**4 - 10 Nm**

- ☐ pay attention to sequence for loosening and tightening  
⇒ [page 59](#)

**5 - Tandem pump**

- ☐ removing and installing  
⇒ [page 136](#)

**6 - 20 Nm**

**7 - 10 Nm**

**8 - Coolant flange**

**9 - O-ring**

- ☐ replace

**10 - 10 Nm**

**11 - Gasket rings**

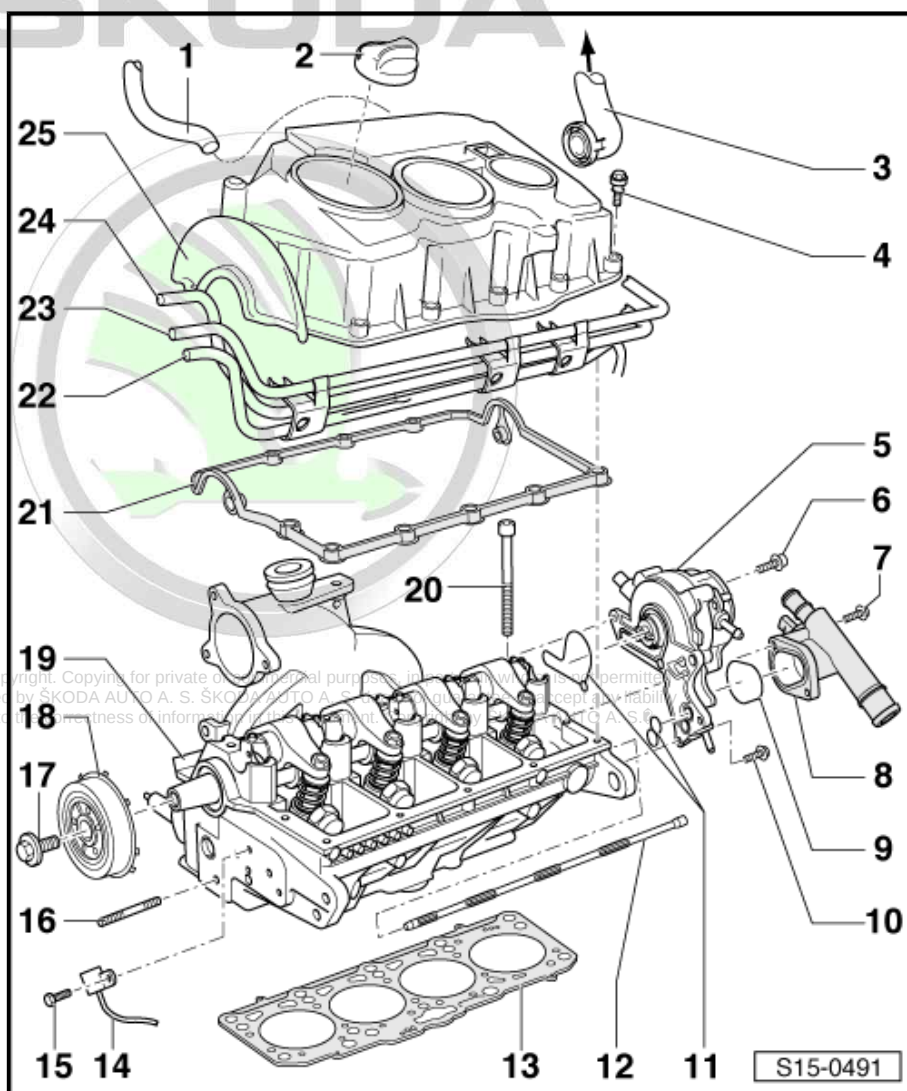
- ☐ replace

**12 - Mixing tube**

- ☐ inserted in the head
- ☐ pull out with hook

**13 - Cylinder head gasket**

- ☐ replace ⇒ [page 61](#)





- ☐ Pay attention to the marking ⇒ [page 59](#)

#### 14 - Hall sender -G40-

- ☐ for camshaft position

#### 15 - 10 Nm

- ☐ mount using locking agent -D 000 600 A2-

#### 16 - 15 Nm

#### 17 - 100 Nm

- ☐ to release and tighten use the counterholder -T10051-

#### 18 - Hub

- ☐ with sensor rotor for the Hall sensor -G40-
- ☐ to remove the extractor -T10052- use
- ☐ remove ⇒ [page 74](#)

#### 19 - Cylinder head

- ☐ removing ⇒ [page 62](#)
- ☐ check for distortion ⇒ [page 58](#)
- ☐ installing ⇒ [page 67](#)
- ☐ after replacing fill entire system with fresh coolant

#### 20 - Cylinder head bolt

- ☐ replace
- ☐ pay attention to order for slackening ⇒ [page 66](#)
- ☐ pay attention to order for tightening ⇒ [page 68](#)
- ☐ before installing, insert washers into the cylinder head

#### 21 - Gasket for cylinder head cover

- ☐ replace if damaged or leaking
- ☐ before fitting, seal contact faces with sealant -D 454 300 A2- ⇒ [page 59](#)

#### 22 - Fuel return-flow line

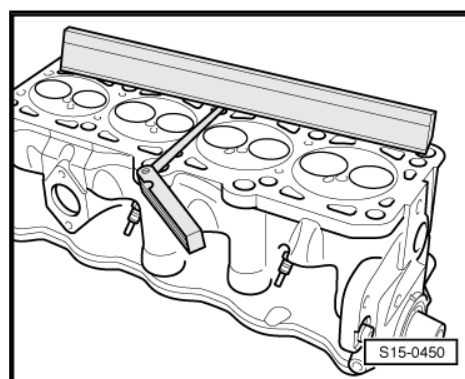
#### 23 - Fuel feed line

#### 24 - Coolant line

#### 25 - Cylinder head cover

- ☐ removing and installing ⇒ [page 59](#)

### Inspecting the cylinder head for distortion



### Special tools and workshop equipment required

- ◆ Feeler gauges
- ◆ Knife-edge straightedge
- Inspect cylinder head at several points for distortion using a knife-edge straightedge and feeler gauge.

- Max. permissible distortion: 0.1 mm.

**i Note**

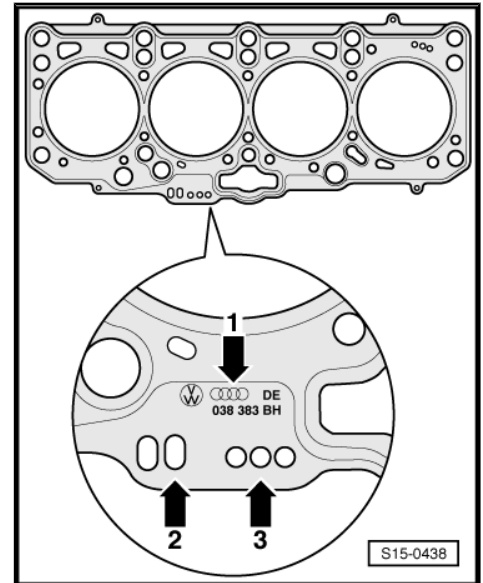
*It is not permissible to rework the cylinder heads of diesel engines.*

**Identification of the cylinder head seal**

- ◆ Spare parts No. = -arrow 1-
- ◆ Control code = -arrow 2- (ignore)
- ◆ Bores = -arrow 3-

**i Note**

*Differing thicknesses of cylinder head gaskets are inserted according to the piston projection. Only install a new gasket with the same identification markings if only replacing the gasket.*



## 1.2 removing and installing cylinder head cover

**Special tools and workshop equipment required**

- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Cleaning and degreasing agent, e.g. -D 000 401 04-
- ◆ Protective goggles and gloves
- ◆ Sealant -D 454 300 A2-

**Removing**

- Remove engine cover ➔ [page 7](#).
- Remove charge air pipe to connection fitting, to do so pull the retaining clips.

**For engine with engine identification characters BJB, BKC, BXE**

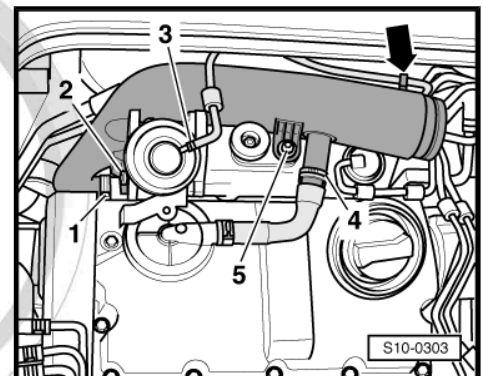
**i Note**

*Coolant hoses as well as fuel lines remain connected.*

- Disconnect vacuum hose -3- from the mechanical exhaust gas recirculation valve.
- Remove crankcase ventilation hose -4- from charge air pipe, unscrew screws -2- and -5- and press the pipe to the rear.

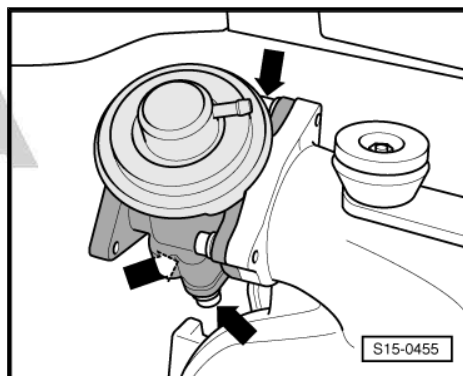
**i Note**

*The charge air pipe remains connected at the turbocharger -1-.*



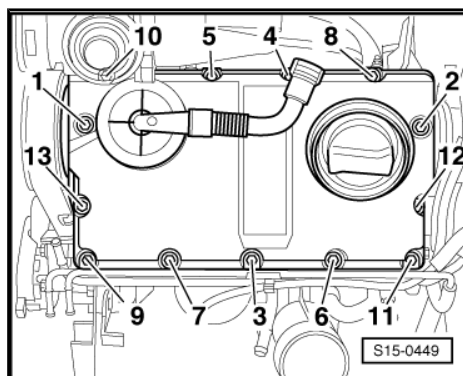


- Unscrew connection fitting with mechanical exhaust gas re-circulation valve -arrows-.
- Remove top toothed belt guard, to do so release retaining clips.



- Unscrew the bolts of the cylinder head cover in the sequence -13 ... 1- and remove cover.

For engine with engine code BLS



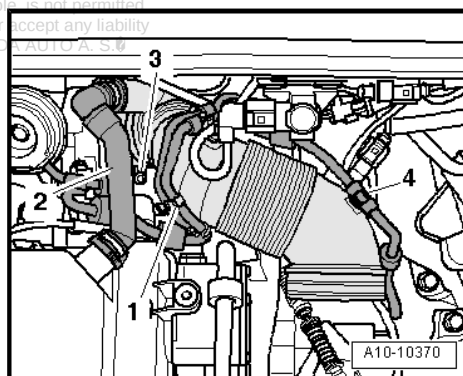
- Pull off hose -2- for crankcase ventilation.
- Pull off the vacuum hose to the vacuum reservoir at the cylinder head.
- Release fuel hoses and coolant hoses at right air guide pipe.



#### Note

*Coolant hoses as well as fuel lines remain connected.*

- Remove top toothed belt guard, to do so release retaining clips.
- Unscrew the bolts of the cylinder head cover in the sequence -13 ... 1- and remove cover.



#### Install

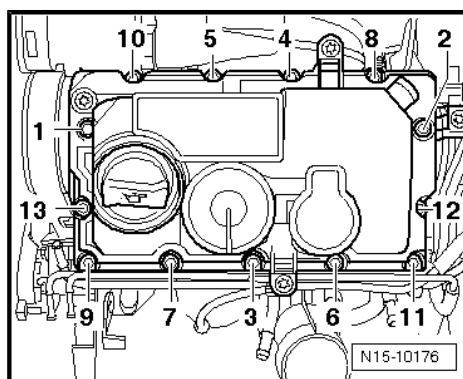
Installation is performed in the reverse order, pay attention to the following points:



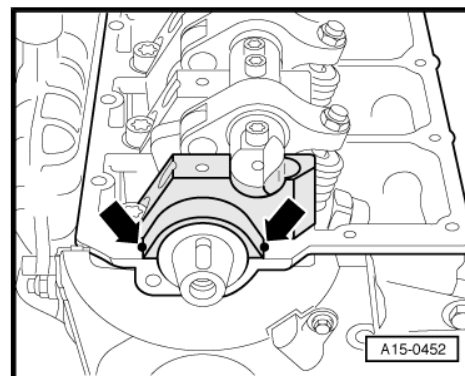
#### WARNING

**Use protective gloves and protective goggles when working with sealant and grease remover!**

- Clear sealing surface on bearing cap and on cylinder head from sealant residues with chemical gasket remover.
- Degrease the sealing surfaces.



- Apply on both edges on the sealing surfaces of the bearing cap/cylinder head -arrows- at front ...



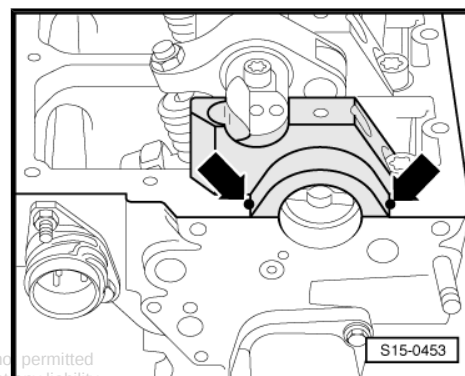
- ... and at rear a small amount of ( $\varnothing$  approx. 5 mm) sealant -D 454 300 A2 - -arrows-.



#### Note

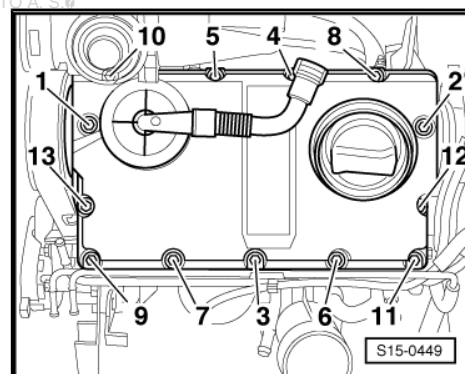
Replace cylinder head cover gasket and cylinder head cover bolts if damaged.

For engine with engine identification characters BJB, BKC, BXE

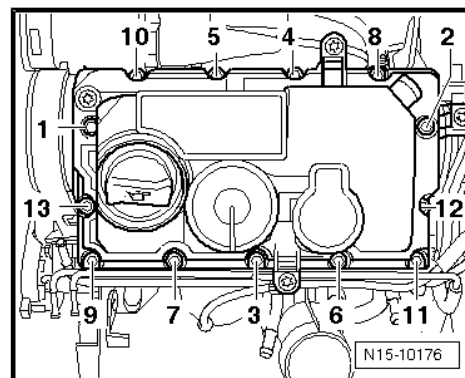


- Tighten the bolts of the cylinder head cover in the sequence -1 ... 13- to 10 Nm.

For engine with engine code BLS



- Tighten the bolts of the cylinder head cover in the sequence -1 ... 13- to 10 Nm.



## 1.3 Removing and installing cylinder head

### Special tools and workshop equipment required

- ◆ Supporting device -T30099-
- ◆ Shim -T30099/1-
- ◆ Hook -MP9-200/10 (10-222A/10)-
- ◆ Workshop crane -VAS 6100 -

- ◆ Lifting device -MP9-201 (2024 A)-
- ◆ Catch pan , e.g. - VAS 6208-
- ◆ Pliers for spring strap clamps
- ◆ Support -T10014-
- ◆ Counterholder -T10051 -
- ◆ Extractor -T10052-
- ◆ Rig pin -3359- or -MP 1-301-
- ◆ Two-hole nut turner -T10020-
- ◆ Crankshaft arrester - T10050- or crankshaft arrester -T10100-
- ◆ Locating bolts -T10060A-
- ◆ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ◆ Protective goggles and gloves

### 1.3.1 Removing

#### Requirements

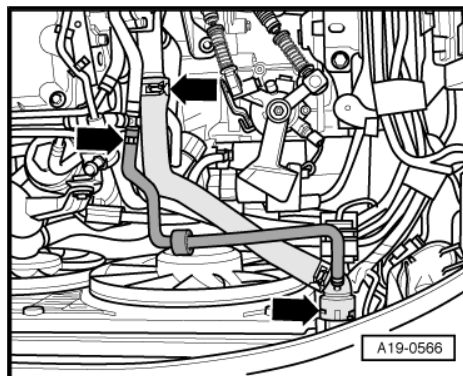
- Engine temperature should not exceed 35°, because the cylinder head could be twisted when slackening the screws.
- The pistons must not be in TDC.
- Switch off ignition and withdraw ignition key.
- Remove engine cover ➔ [page 7](#) .
- Remove air filter, charge air pipes and charge air hoses.
- ◆ Engine identification characters BJB, BKC, BXE ➔ [page 157](#)
- ◆ Engine identification characters BLS: ➔ [page 159](#)
- Remove the middle and right sound dampening system ➔ Body Work ➔ Rep. Gr. 50 .
- Position drip tray (e.g. -VAS 6208 - ) under the engine.



#### WARNING

*Hot steam or hot coolant may escape when the compensation bottle is opened. Cover the cap with a cloth and open carefully.*

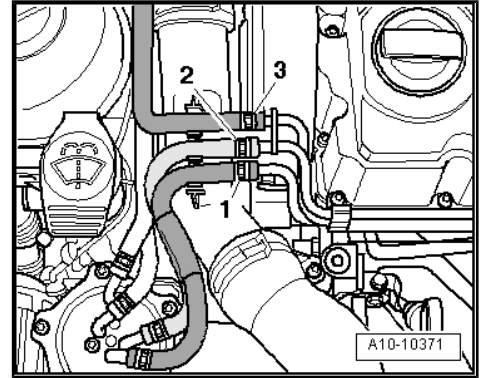
- Drain coolant ➔ [page 106](#) .
- Remove coolant hose between engine and radiator -arrows-.
- Use hand vacuum pump to extract the fuel at the return-flow hose of the tandem pump ➔ [page 136](#) .



- Detach the fuel intake hose -2- and the fuel return hose -1- from the fuel lines.
- Remove coolant hose -3-.

**For engine with engine identification characters BJB, BKC, BXE**

- Remove front exhaust pipe ➔ [page 185](#) .



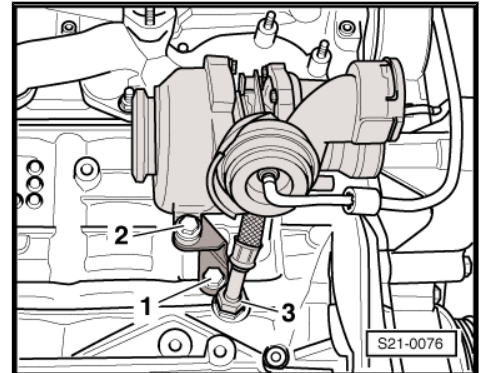
- Release screws -1- and -2- and remove bracket for turbo-charger.



**Note**

*Collect any engine oil which flows out with a cloth.*

- Remove the oil return line -3- at the cylinder block.
- Unscrew oil feed line from turbocharger, exhaust manifold and from coolant pipe and lay it to one side.



**For engine with engine code BLS**

- Remove the air guide pipe between the exhaust turbocharger and the charge air cooler ➔ [page 159](#) .

**For vehicles with auxiliary heating**

- Disconnect the fuel feed line.

**For vehicles with engine code BLS**

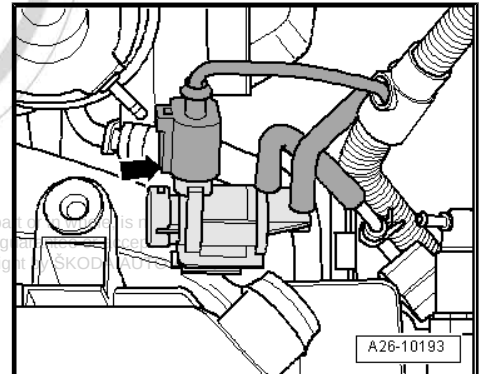
- Remove front exhaust pipe with diesel particle filter ➔ [page 191](#) .



**Note**

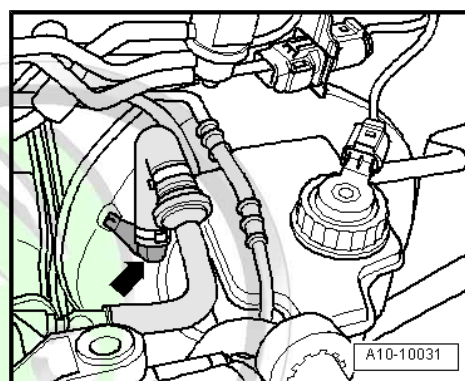
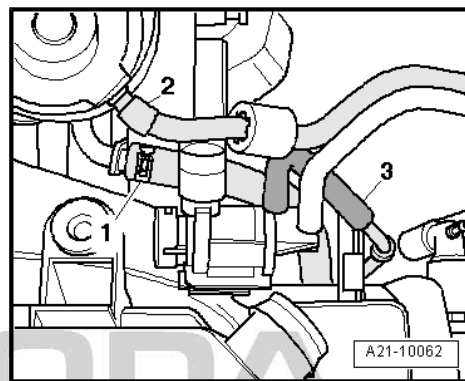
*On four-wheel drive vehicles the front exhaust pipe with diesel particle filter can remain in the engine compartment and the angle gearbox must not be removed.*

- Disconnect plug connection at changeover valve for radiator of exhaust gas recirculation -N345- -arrow-.

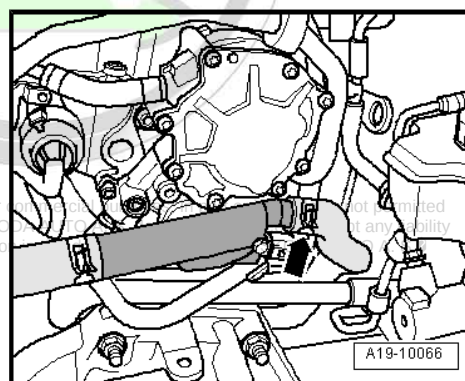


Protected by copyright. Copying for private or commercial purposes, in part or in full, is prohibited unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee the correctness of information in this document. Copyright © ŠKODA AUTO A. S.

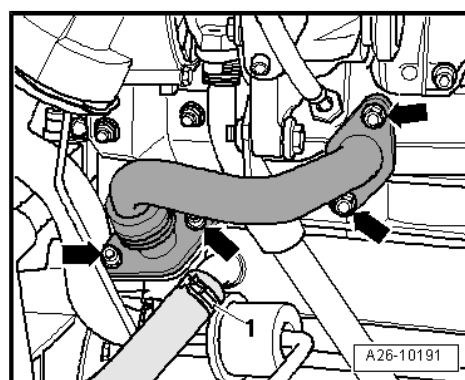
- Remove the vacuum hose -2- at the vacuum unit for charge pressure control.
- Disconnect vacuum hose -3- at the cable for vacuum setting element of the recirculation flap for exhaust gas recirculation.
- Pull off vacuum line at the tandem pump.
- Slacken changeover valve for radiator of exhaust gas recirculation -N345- at bracket.
- Lay changeover valve for radiator of exhaust gas recirculation -N345- with connected hoses to the side.
- Detach oil intake hose -1- from exhaust turbocharger.
- Remove oil feed pipe.
- Pull the vacuum hose -arrow- off the brake servo unit.



- Remove coolant hose -arrow- at coolant fitting.
- Disconnect the plug from the coolant temperature sender -G62- and detach the electrical wiring
- Unscrew the fixing screws for oil dipstick guide tube, pull out oil dipstick guide tube to the top out of the cylinder block.



- Disconnect the coolant hose -1- at exhaust gas recirculation radiator.
- Remove connection pipe for exhaust gas recirculation radiator -arrows-.

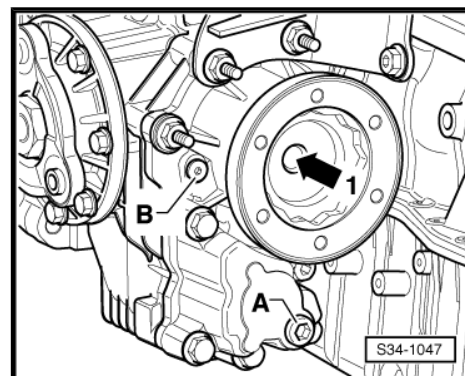


**For four-wheel drive vehicles**

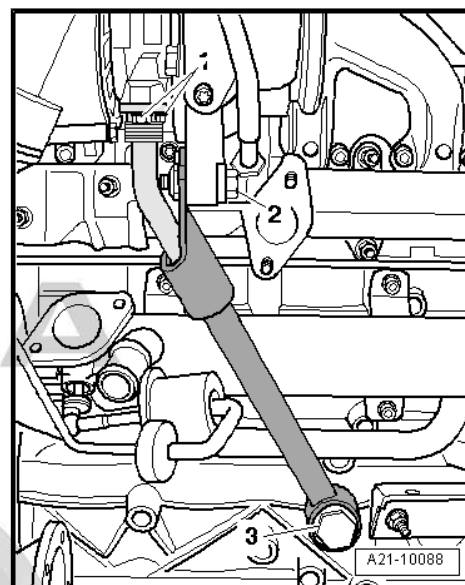


- Remove right flange shaft ⇒ Gearbox ⇒ Rep. Gr. 39 .
- Unscrew screw for right flange shaft -arrow 1-.

**For vehicles with engine code BLS**



- Release screws -1-, screw -2- and hollow screw -3-.
- Remove support for exhaust turbocharger with oil return line.



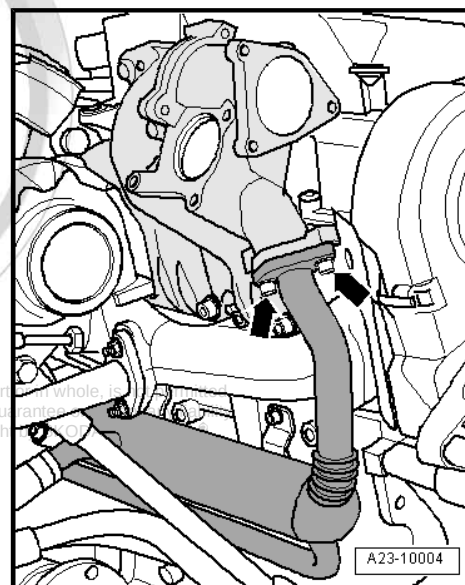
- Unscrew screws out of the flange between the exhaust gas recirculation radiator and intake manifold -arrows-.

**For vehicles with auxiliary heating**

- Remove exhaust pipe of auxiliary heating (only for vehicles with extended exhaust pipe) ⇒ Heating, Air Conditioning ⇒ Rep. Gr. 82 .
- Remove coolant pipe to auxiliary heating with connected coolant hoses at cylinder block.

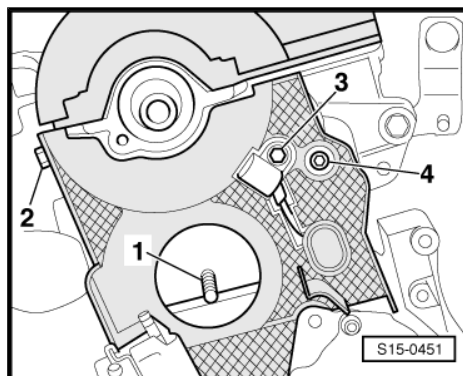
**For all vehicles**

- Removing toothed belt ⇒ [page 24](#) .
- Remove camshaft sprocket and hub ⇒ [page 74](#) .



- Remove toothed belt tensioning pulley.
- Screw out screw -3- and remove Hall sender -G40- from cylinder head.
- Disconnect all remaining plug connections at cylinder head and lay aside the electrical lines.
- Separate all remaining coolant, charge air and vacuum hoses and pipes from the cylinder.
- Release screws -2...4-.

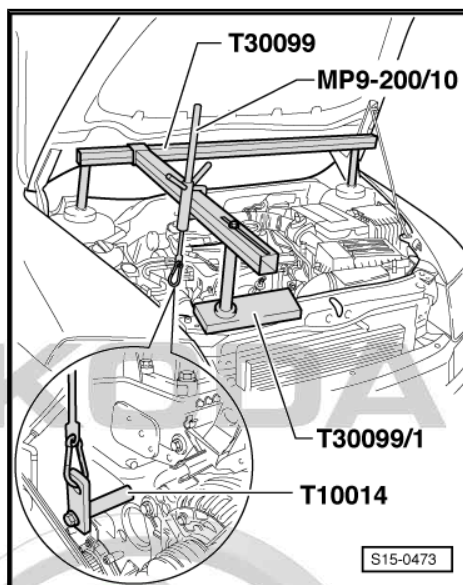
**Except vehicles manufactured during the period of time from 05.05 to 05.07**



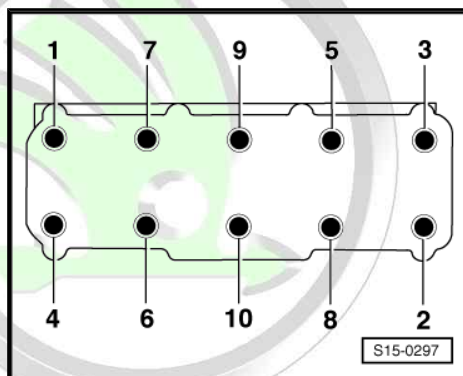
- Install -T10014- bracket. Tighten screw for bracket to 20 Nm.
- Support engine from underneath.
- Offset hook -MP9-200/10 (10-222A/10) - for supporting device -T30099- from the right lifting eye of the engine into the lug of the bracket -T10014- and preload engine via the spindle, do not lift.

**For all vehicles**

- Remove cylinder head cover ➔ [page 59](#) .



- Follow the specified order for loosening cylinder head bolts.
- Carefully raise cylinder head with lifting device -MP9-201 (2024 A)- and workshop crane -VAS 6100- .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 1.3.2 Install



### Note

- ◆ *Carefully remove residual sealant from the cylinder head and cylinder block. Make sure this does not cause any extended scoring or scratching.*
- ◆ *There must not be any oil or coolant present in the blind holes for the cylinder head bolts.*
- ◆ *Replace cylinder head bolts.*
- ◆ *When undertaking assembly replace self-locking nuts, which have been tightened to a turning angle, as well as gasket rings and gaskets.*
- ◆ *Remove the new cylinder head seal from its wrapping immediately before fitting.*
- ◆ *Treat the seal with the utmost care. Damage to the silicone layer and in the area of the bead results in leakages.*
- ◆ *When installing an exchange cylinder head with the camshaft installed, it is necessary to oil the contact surfaces between bucket tappets and the cam track after installing the cylinder head.*
- ◆ *The plastic base for protecting the open valves should only be removed immediately before attaching the cylinder head.*
- ◆ *Secure all hose connections with corresponding hose clips.*



### WARNING

***Use protective gloves and protective goggles when working with sealant and grease remover!***

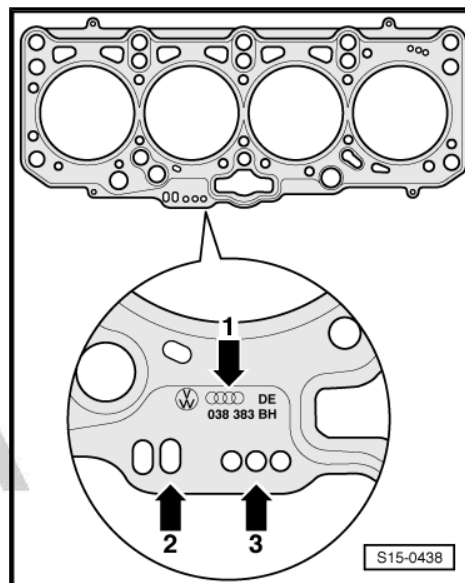
- Make sure that when cleaning the cylinder head and cylinder block no foreign bodies can get into the cylinder or into the oil and coolant galleries.
- Carefully remove residual sealant from the cylinder head and cylinder block with chemical sealant remover.
- Before fitting the cylinder head rotate the crankshaft so that all the pistons are almost evenly at TDC of cylinder 1.

- Pay attention to the identification of the cylinder head seal.
- ◆ Spare parts No. = -arrow 1-
- ◆ Control code = -arrow 2- (ignore)
- ◆ Bores = -arrow 3-

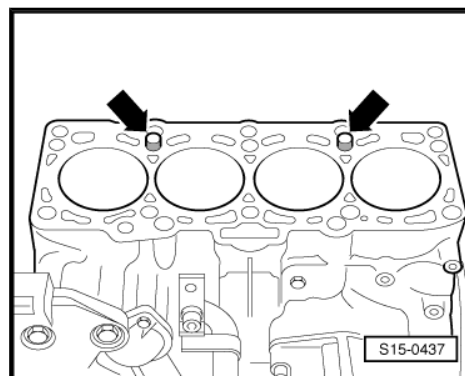


# Note

- ◆ If the cylinder head gasket or cylinder head were replaced, install a new cylinder head gasket with the same identification marking.
- ◆ If parts of the crankshaft drive were replaced then the new cylinder head gasket must be defined by measuring the protrusion of the pistons in TDC.

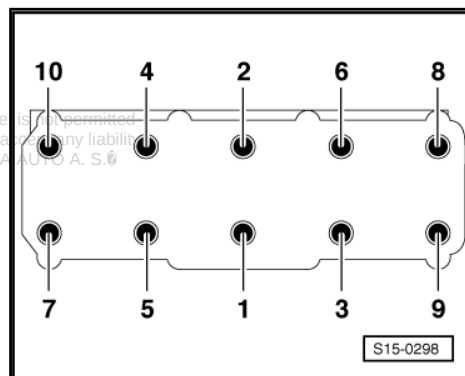


- Fit on cylinder head gasket.
- Pay attention to dowel sleeves -arrows- in cylinder block.
- Note the installed position of the cylinder head gasket, the marking "above" or the spare part number must point to the cylinder head.
- Insert the cylinder head.

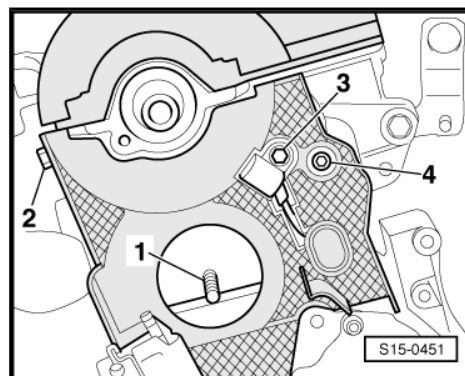


- Insert cylinder head bolts and tighten by hand.
- Tighten the cylinder head in four stages in the indicated tightening sequence:

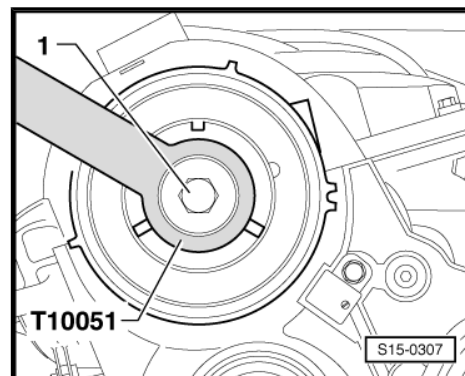
| Stage | Tighten                                                 |
|-------|---------------------------------------------------------|
| I     | - Pre-tighten with the torque wrench to 35 Nm.          |
| II    | - Pre-tighten with the torque wrench to 60 Nm.          |
| III   | - Using a rigid wrench torque a further 90° (1/4 turn). |
| IV    | - Using a rigid wrench torque a further 90° (1/4 turn). |



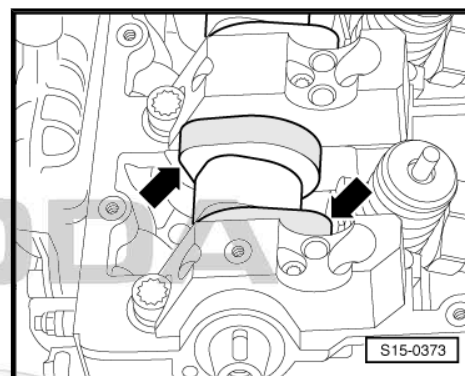
- Screw lifting eye of engine onto the front cylinder head.
- Insert screws -2 ... 4- with spread on locking agent -D 000 600 A2- and tighten to 10 Nm.
- Install Hall sender -G40-, insert screws -3- with spread on locking agent -D 000 600 A2 - and tighten to 10 Nm.
- Screw in the pin screw -1- and tighten to 15 Nm.



- Position hub onto camshaft.
- Tighten screw -1- to 100 Nm, use counterholder -T10051- to hold.



- First of all position camshaft and then also crankshaft on TDC cylinder 1:
- For the camshaft, the cams of cylinder 1 must be pointing up evenly -arrows-...

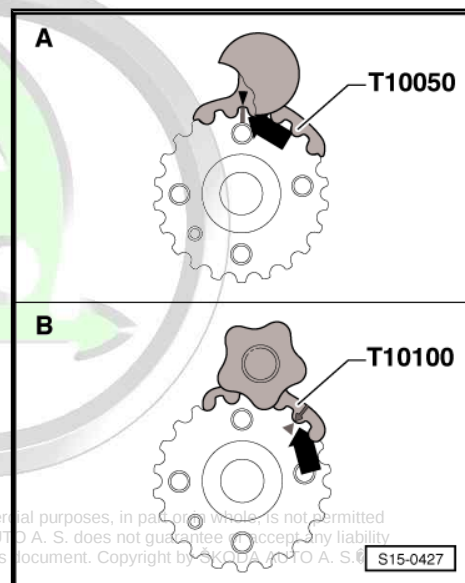


- ... and depending on the version, the crankshaft timing belt sprocket must be locked with the crankshaft arrester -T10050- or crankshaft arrester -T10100- .



**Note**

- ◆ *Markings on the timing belt gear and on the crankshaft arrester must be in line with each other -arrow-. Stud on the crankshaft arrester must engage into the hole in the sealing flange.*
- ◆ *The crankshaft arrester can only be fitted onto the timing belt gear from the front side of the serration.*



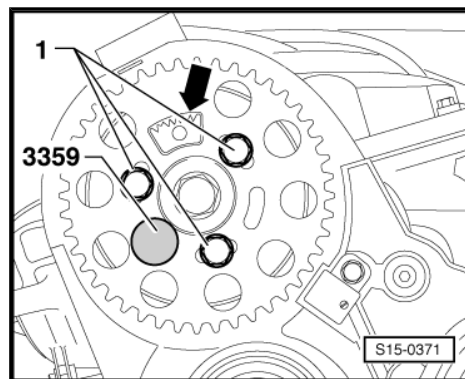
Protected by copyright. Copying for private or commercial purposes, in part or whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.



- Push camshaft sprocket onto the hub.
- The gear segment -arrow- of the camshaft timing gear must be at the top.
- Slightly screw in plug -1-.
- Interlock hub with locking pin e.g. -3359- .
- install (set the timing) ⇒ [page 24](#) .
- Install cylinder head cover ⇒ [page 59](#) .

Further installation occurs in reverse order, while paying attention to the following:

- Install exhaust system and align free of stress ⇒ [page 195](#) .
- Checking the oil level ⇒ Maintenance ; Octavia II .



### Note

*Change dirty engine oil ⇒ Maintenance ; Octavia II .*

- Top up or replace coolant ⇒ [page 106](#) .
- Then interrogate the fault memory of engine control unit and erase ⇒ Vehicle diagnosis, testing and information system VAS 5051.

## 1.4 Testing the compression

### Special tools and workshop equipment required

- ◆ Compression tester , e.g. -V.A.G 1763-
- ◆ Adapter , e.g. -V.A.G 1381/12 -
- ◆ Hinged wrench

### Test conditions

Engine oil temperature at least 30°C.

### Test sequence

- Remove engine cover ⇒ [page 7](#) .
- Detach central plug connection for unit injectors and edge connector for glow plugs.
- Unscrew all glow plugs with flexible-head wrench.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for errors or omissions in the contents of information in this document. Copyright by ŠKODA AUTO A. S. ©

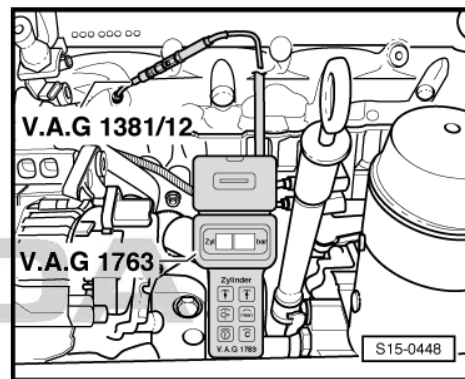
- Screw the adapter (e.g. -V.A.G 1381/12 - ), in place of the glow plug into the relevant cylinder.
- Test compression with compression tester (e.g. - V.A.G 1763- ).



**Note**

*Use of tester ⇒ Operating Instructions .*

- The 2nd mechanic operates the starter until the tester no longer indicates a pressure rise.



**Compression readings**

| New                 | Wear limit          | permissible difference between cylinders |
|---------------------|---------------------|------------------------------------------|
| <b>Overpressure</b> | <b>Overpressure</b> | <b>Overpressure</b>                      |
| 2.5...3.1 MPa       | 1.9 MPa             | max. 0.5 MPa                             |
| 25...31 bar         | 19 bar              | max. 5 bar                               |

**Perform after the compression pressure test:**

- Install glow plugs and tighten to 15 Nm.
- Connect central plug connection for unit injectors and edge connector for glow plugs.
- Then interrogate the fault memory of engine control unit and erase ⇒ Vehicle diagnosis, testing and information system VAS 5051.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

## 2 Repairing valve gear



### Note

- ◆ After installing the camshaft, the engine must not be started for about 30 minutes. The hydraulic bucket tappets must settle (otherwise valves would strike the pistons).
- ◆ After carrying out work on the valve gear, carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started.
- ◆ Always replace gasket rings and seals.
- ◆ Removing and installing the tandem pump ➔ [page 136](#).

### 1 - Cylinder head

- ☐ reworking valve seats  
➔ [page 82](#)

### 2 - Bearing shell

- ☐ Check fitting position
- ☐ do not mix up used bearing shells (mark)
- ☐ ensure the retaining lugs are correctly located in the bearing caps and in the cylinder head

### 3 - Camshaft

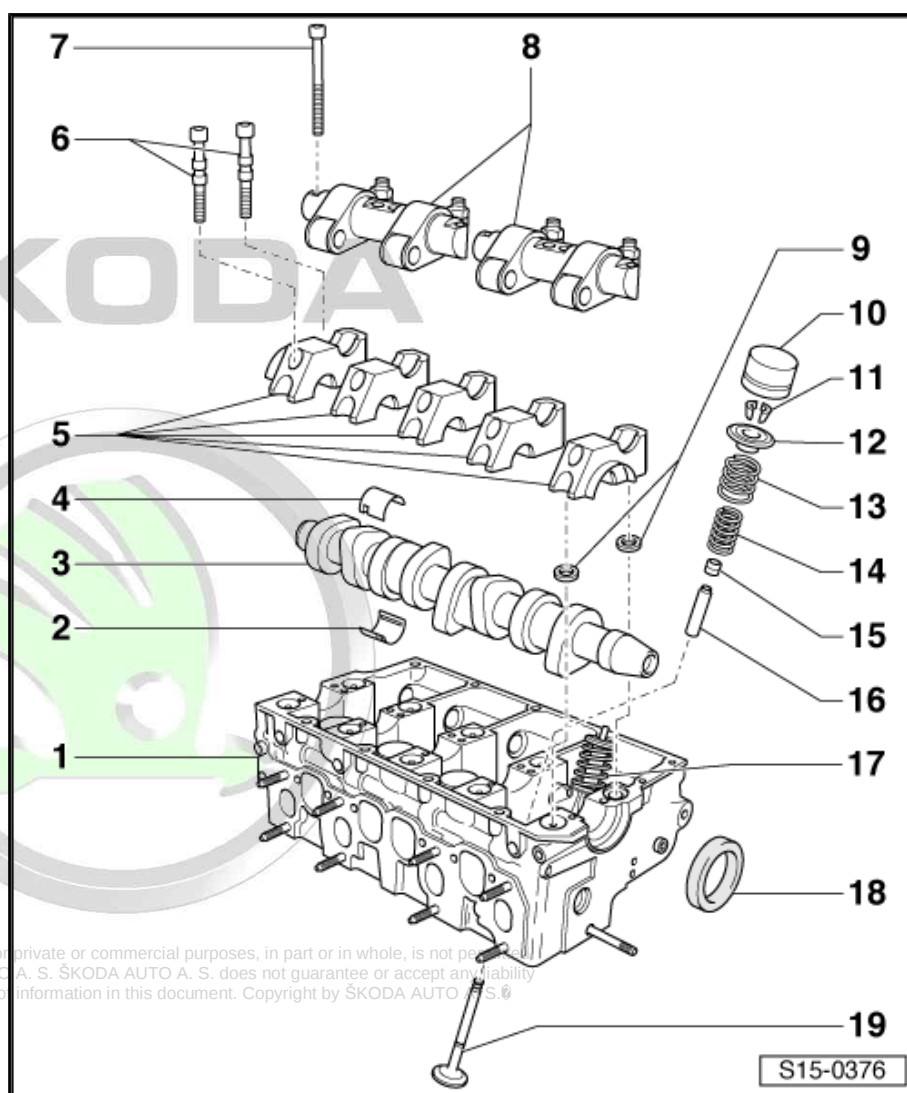
- ☐ Radial play wear limit: 0.11 mm
- ☐ Slack: max. 0.04 mm
- ☐ Inspecting axial play  
➔ [page 73](#)
- ☐ removing and installing  
➔ [page 76](#)

### 4 - Bearing shell

- ☐ Check fitting position
- ☐ do not mix up used bearing shells (mark)
- ☐ ensure the retaining lugs are correctly located in the bearing caps and in the cylinder head

### 5 - Bearing caps

- ☐ removing and installing  
➔ [page 76](#)
- ☐ Seal bearing caps 1 and 5 with sealant -D 454 300 A2-



### 6 - 8 Nm + torque a further 90° (1/4 turn)

- ☐ replace

### 7 - 20 Nm + torque a further 90° (1/4 turn)

- ☐ replace
- ☐ pay attention to sequence for loosening and tightening ➔ [page 76](#)

## 8 - Valve-lever shaft

- ☐ do not mix up (mark)
- ☐ pay attention to sequence for loosening and tightening ⇒ [page 76](#)

## 9 - Washer

- ☐ for cylinder head screws
- ☐ before installing the bearing caps, insert into the cylinder head

## 10 - Hydraulic bucket tappets

- ☐ check ⇒ [page 79](#)
- ☐ removing and installing ⇒ [page 80](#)
- ☐ do not mix up (mark)
- ☐ lay aside with contact surface facing down
- ☐ before installing check axial play of the camshaft ⇒ [page 73](#)
- ☐ oil contact surfaces

## 11 - Valve collets

## 12 - Valve spring retainer

## 13 - Valve spring outside

- ☐ removing and installing ⇒ [page 80](#)

## 14 - Valve spring inside

- ☐ removing and installing ⇒ [page 80](#)

## 15 - Valve stem seal

- ☐ replace ⇒ [page 80](#)

## 16 - Valve guide

- ☐ check ⇒ [page 82](#)

## 17 - The unit injector

- ☐ removing and installing ⇒ [page 178](#)

## 18 - Gasket ring

- ☐ replace ⇒ [page 74](#)

## 19 - Valves

- ☐ Valve dimensions ⇒ [page 82](#)
- ☐ do not rework, only grinding in is permissible

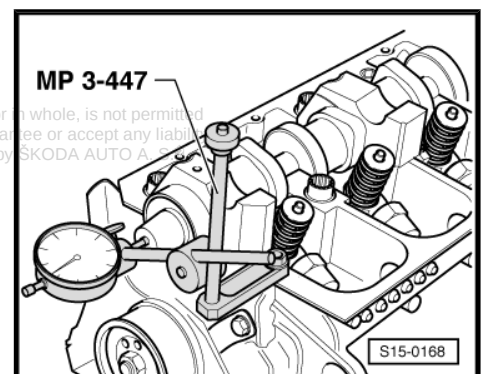
## 2.1 Checking the axial play of the camshaft

### Special tools and workshop equipment required

- ◆ Universal dial gauge holder -MP3-447 (VW 387)-
- ◆ Dial gauge

### Test sequence

- Perform measurement with the bucket tappets removed and the first and last bearing cap fitted.
- Wear limit: max. 0.15 mm.



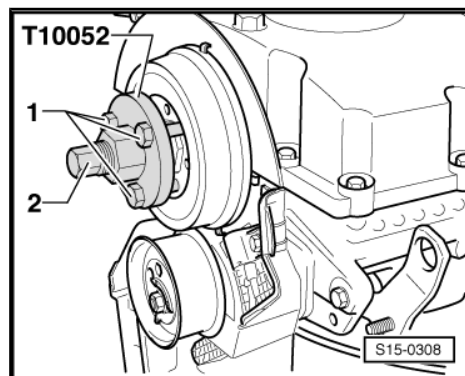
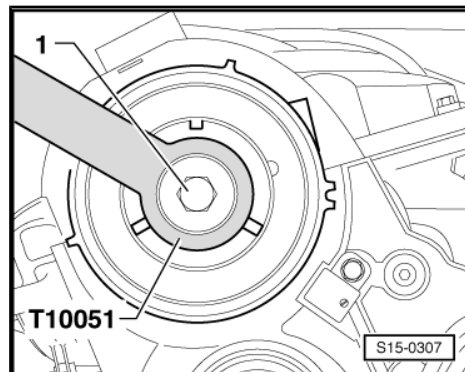
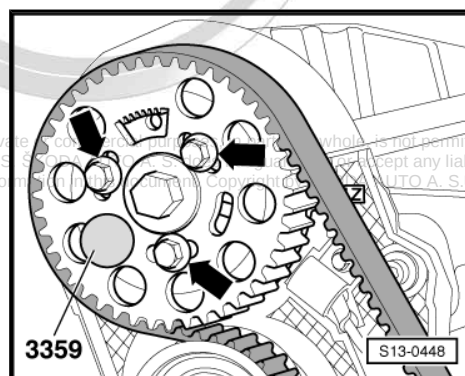
## 2.2 Replacing camshaft gasket ring

### Special tools and workshop equipment required

- ◆ Insertion tool -MP1-214 (10-203) -
- ◆ Gasket ring extractor -T30003 (3240)-
- ◆ Counterholder -T10051 -
- ◆ Extractor -T10052-
- ◆ Screw M12x65

### Removing

- Cylinder head attached at engine.
- Removing toothed belt ➔ [page 24](#) .
- Remove the locking pin -3359- .
- Unscrew bolts -arrows- of camshaft sprocket and pull camshaft sprocket off the hub.
- Loosen fixing bolt of the hub -1- approx. 2 turns, to do so use the counterholder -T10051- .
- Position the extractor -T10052- and screw the screws -1- into the hub.
- Pull off the hub, to do so counterhold the hexagon (SW30) of the extractor and screw in the screw -2-.
- Set the inner part of the sealing ring extractor -T30003 (3240)- flush with the outer part and interlock with the knurled screw.





- Oil the thread head of the gasket ring extractor, position and forcibly screw into the gasket ring of the camshaft as far as possible.
- Release knurled screw and turn the inner side against the camshaft until the gasket ring is pulled out.
- Clamp gasket ring extractor into the vice and remove gasket ring with pliers.
- Clean the contact and sealing surface.

#### Install

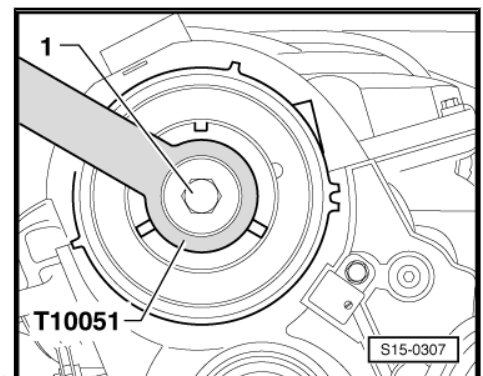
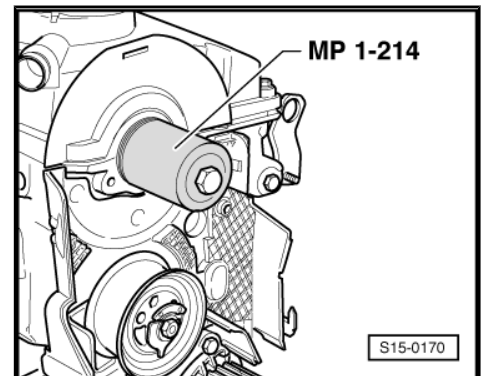
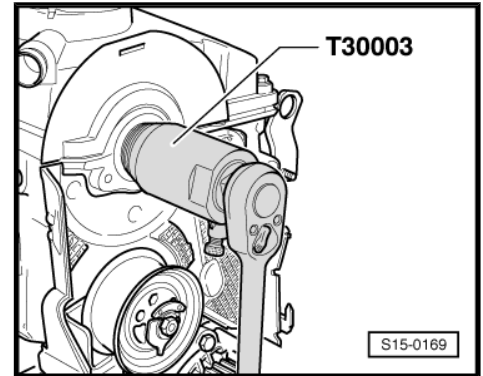
Installation is performed in the reverse order, pay attention to the following points:



#### Note

*Do not additionally lubricate or grease sealing lips of the gasket ring.*

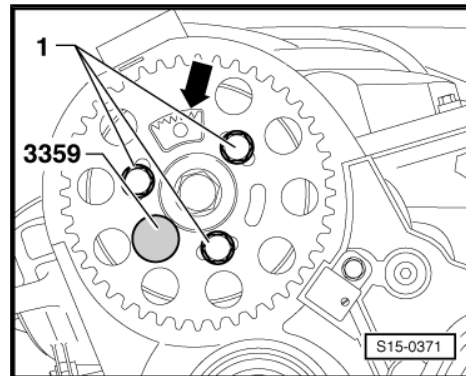
- Remove oil residue from the camshaft stud with a clean cloth.
- Cover slot on the camshaft cone with adhesive tape and carefully push the sealing ring onto the camshaft.
- Push on the sealing ring with the pressure plate of the insertion tool -MP1-214 (10-203)- and press in the screw M12x65 up to the stop.
- Fit hub onto camshaft.



- Tighten screw -1- to 100 Nm, use counterholder -T10051- to hold.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

- Push camshaft sprocket onto hub.
- Tooth segment -arrow- of camshaft sprocket must be facing up.
- Slightly screw in plug -1-.
- Interlock hub with locking pin e.g. -3359- .
- install (set the timing) ⇒ [page 24](#) .



## 2.3 Removing and installing camshaft

### Special tools and workshop equipment required

- ◆ Counterholder -T10051 -
- ◆ Extractor -T10052-
- ◆ Silicone sealant -D 176 404 A2-
- ◆ Sealant -D 454 300 A2-

### 2.3.1 Removing

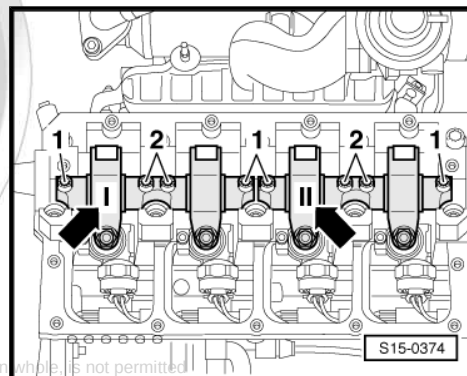
- Cylinder head attached at engine.
- Removing toothed belt ⇒ [page 24](#) .
- Remove tandem pump ⇒ [page 136](#) .



#### Note

*The hoses can remain connected to the tandem pump.*

- Remove camshaft sprocket and pull off hub ⇒ [page 74](#) .
- Remove cylinder head cover ⇒ [page 59](#) .
- Mark the valve-lever shafts with waterproof marker to avoid mixing them up and to avoid a destruction of the basic setting of the pump-nozzle units -arrows-.
- First release the two outer -1- and then the inner screws -2- of the valve-lever shafts.
- Remove valve-lever shafts.

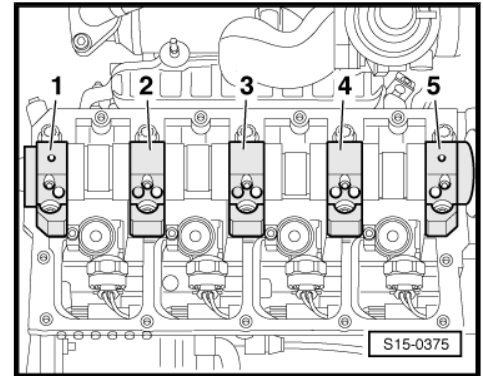


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

- First remove bearing caps -1-, -3- and -5-.
- Then release bearing caps -2- and -4- alternately and cross-wise.

**i Note**

- ◆ *Ensure that the bearing shells of the camshaft are not mixed up.*
  - ◆ *Mark assignment of the bearing shells for the camshaft with waterproof marker on the reverse side.*
- Take out camshaft.



## 2.3.2 Install

Installation is performed in the reverse order, pay attention to the following points:

- Check if the crankshaft is on TDC for cylinder 1.
- Depending on the version, lock the crankshaft timing belt sprocket with the crankshaft arrester -T10050- or crankshaft arrester -T10100- on TDC cyl. 1.

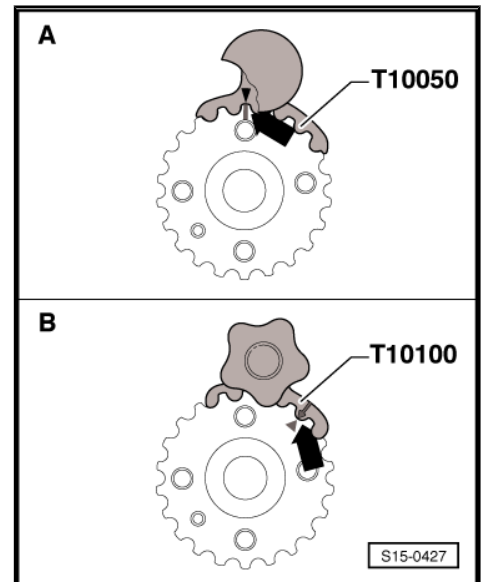
### Version of the crankshaft timing belt sprocket:

A = original version of timing belt sprocket with circular tooth flank, rectangular marking for TDC at tooth in 12 o'clock - use crankshaft arrester -T10050-

B = new version of timing belt sprocket with elliptical tooth flank, triangular marking for TDC at tooth opening 1 o'clock - use crankshaft arrester - T10100-

**i Note**

- ◆ *The markings on the timing belt gear and on the crankshaft arrester must be in line with each other -arrow-. The stud on the crankshaft arrester must engage into the hole in the sealing flange.*
- ◆ *The crankshaft arrester can only be fitted onto the timing belt gear from the front side of the serration.*

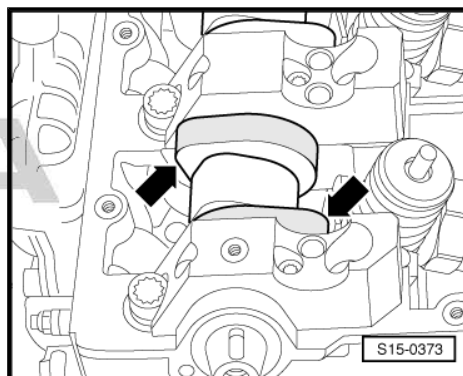


Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

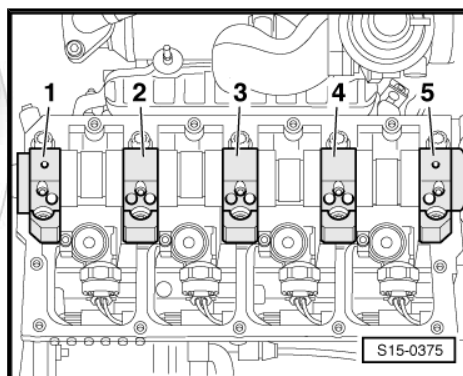
**i Note**

- ◆ *Ensure that the used bearing shells of the camshaft are not mixed up (pay attention to marking).*
- ◆ *When installing the camshaft pay attention to a correct fit of the retaining lugs of the bearing shells in the bearing caps and cylinder head.*

- Oil contact surfaces of camshaft.
- Insert camshaft into the TDC for cylinder 1:
- The cams for cylinder 1 on the camshaft must point upwards -arrows-.



- Then tighten bearing caps -2- and -4- alternately and cross-wise.

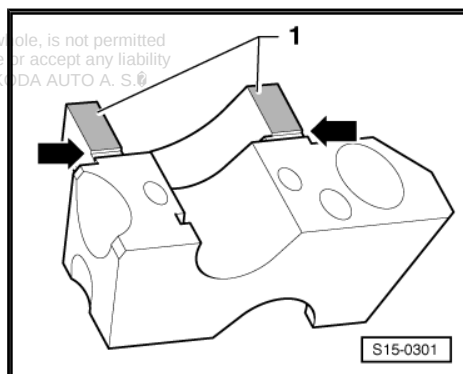


- Apply sealant -D 454 300 A2- thinly and uniformly to the outer bearing caps onto the surfaces -1-.

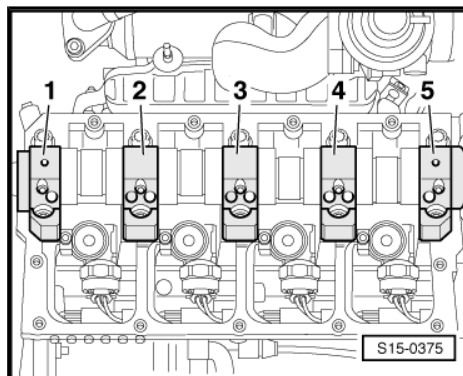


**Note**

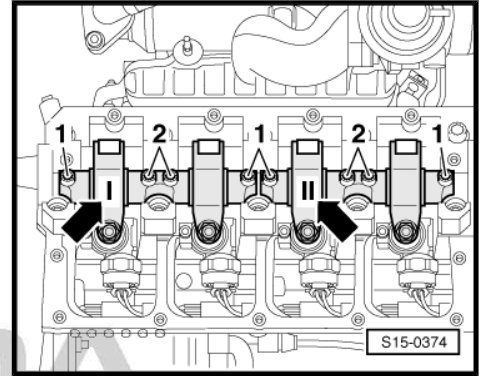
*Make sure no sealant penetrates into the slots -arrows- and onto the other surfaces.*



- Install and tighten bearing caps -1-, -3- and -5-.
- Bearing cap -5- must fit flush with the outer edge of the cylinder head as this may otherwise cause leaks on the tandem pump.



- Install valve-lever shafts. At the same time pay attention to the markings -arrows- when removing.
- First tighten the inner -2- and then the outer screws -1- in several stages.
- Install gasket ring for camshaft, hub and camshaft sprocket ⇒ [page 75](#) .
- Lock hub of camshaft with locking pin -3359- .
- install (set the timing) ⇒ [page 24](#) .
- Install tandem pump ⇒ [page 136](#) .
- If the valve-lever shafts or ball pins were replaced, the unit injectors must be adjusted ⇒ [page 176](#) .
- Install cylinder head cover ⇒ [page 59](#) .



**i** Note

- ◆ *After installing the camshaft, the engine must not be started for about 30 minutes. The hydraulic bucket tappets must settle (otherwise valves would strike the pistons).*
- ◆ *After carrying out work on the valve gear, carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started.*

## 2.4 Testing hydraulic bucket tappets

### Special tools and workshop equipment required

- ◆ Feeler gauges
- ◆ Wooden or plastic wedge

**i** Note

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

- ◆ *Hydraulic bucket tappets cannot be repaired.*
- ◆ *Irregular valve noises when starting engine are normal.*

### Test sequence

- Start engine and allow to run until the radiator fan starts once. Increase speed to about 2500 rpm for 2 minutes and undertake a test drive if necessary.

**i** Note

*If there are irregular valve noises which disappear after a long drive but keep reappearing on short journeys then the oil retaining valve is defective. Fitting location: in the oil filter holder. The oil retaining valve cannot be replaced individually.*

If the hydraulic bucket tappets are still loud, determine the faulty hydraulic bucket tappets as follows:

- Remove the cylinder head cover.
- Turn the crankshaft until the cam of the hydraulic bucket tappets to be tested is positioned on top; while doing so push the vehicle forward in 4th gear when ignition is switched off.



- Determine the play between the cams and the bucket tappet:
- Press down the bucket tappet using a wooden or plastic wedge.

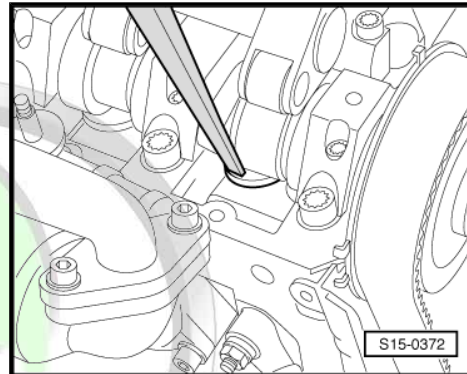
If a 0.20 mm feeler gauge can be slipped between the camshaft and the bucket tappet:

- Replace hydraulic bucket tappets ⇒ [page 76](#) .



#### Note

- ◆ *After installing the camshaft, the engine must not be started for about 30 minutes. The hydraulic bucket tappets must settle (otherwise valves would strike the pistons).*
- ◆ *After carrying out work on the valve gear, carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started.*



## 2.5 Replacing valve stem seals

### Cylinder head fitted

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

### Special tools and workshop equipment required

- ◆ Assembly device -MP1-213 (2036)-
- ◆ Extractor -MP1-206 (3047 A)-
- ◆ Insertion tool -MP1-306 (10-204)-
- ◆ Valve lever -MP1-211 (VW 541/1a,/5)-



#### Note

- ◆ *With cylinder head removed:*
- ◆ *Remove glow plugs from the cylinder head ⇒ [page 204](#) .*
- ◆ *Remove unit injectors from the cylinder head ⇒ [page 178](#) .*
- ◆ *Position cylinder head on a suitable flat valve supporting plate.*

### Removing

- Remove the camshaft ⇒ [page 76](#) .



#### Note

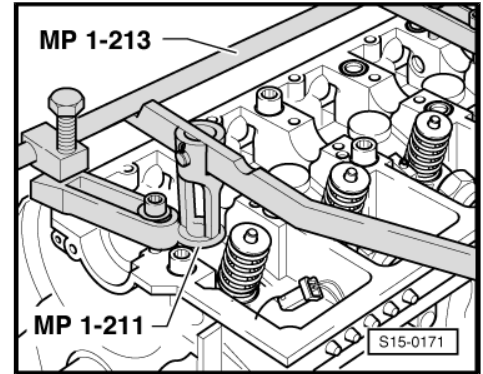
- ◆ *Ensure that the used bearing shells of the camshaft are not mixed up (pay attention to marking).*
- ◆ *When installing the camshaft, ensure it is correctly located in the retaining lugs of the bearing shells in the bearing caps and in the cylinder head.*
- ◆ *Ensure that the bucket tappets are not mixed up, for this step mark the assignment with waterproof marker on the reverse side.*
- Remove bearing shells of camshaft from the cylinder head.
- Remove bucket tappets and lay aside with the contact surface facing down. Make sure that you do not mix up the tappets.
- Position piston of the relevant cylinder to top dead centre (TDC).

- Insert the assembly device for valves -MP1-213 (2036)- and adjust bearing to the stay bolt height.
- Remove valve springs with valve lever -MP1-211 (VW 541/1a,5)- .



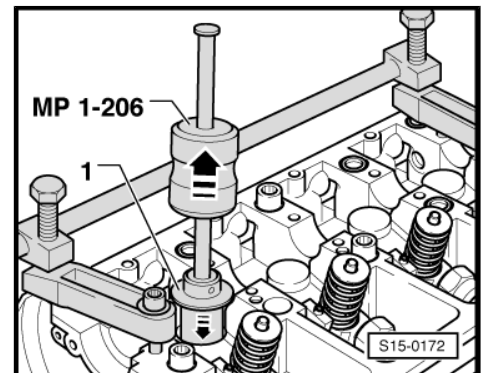
**Note**

*The valves rest on the piston crown.*

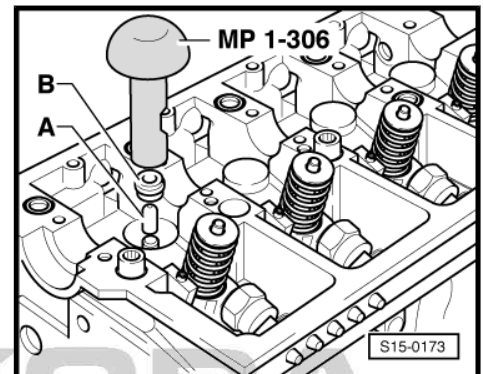


- Pull off valve stem seals with -MP1-206 (3047 A)- .

**Install**



- Insert the supplied plastic bushings -A- on the relevant valve stem. This will prevent any damage to the new valve stem seals -B -.
- Insert the new valve stem seal in the insertion tool -MP1-306 (10-204)- .
- Oil the sealing lip of the valve stem seal and carefully slide into the valve guide.
- Remove plastic sleeve.
- Reinstall valve springs and secure with collets.
- Insert bucket tappets.
- Install the camshaft ➔ [page 76](#) .



**Note**

- ◆ *After installing the camshaft, the engine must not be started for about 30 minutes. The hydraulic bucket tappets must settle (otherwise valves would strike the pistons).*
- ◆ *After carrying out work on the valve gear, carefully crank engine at least 2 revolutions to ensure that no valve touches the piston when the engine is started.*

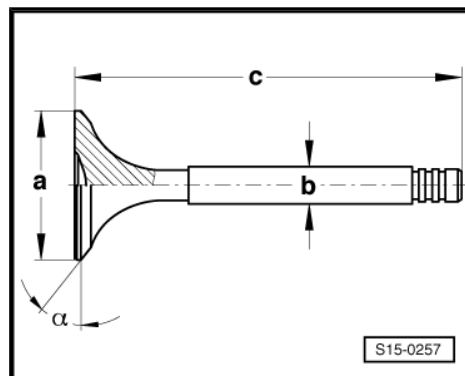
## 2.6 Valve dimensions

| Dimension       |    | Inlet valve | Exhaust valve |
|-----------------|----|-------------|---------------|
| $\varnothing a$ | mm | 35,95       | 31,45         |
| $\varnothing b$ | mm | 6,980       | 6,965         |
| c               | mm | 89,45       | 89,05         |
| $\alpha$        | °  | 45          | 45            |



### Note

Valves must not be reworked by grinding. Only grinding in with grinding paste is permissible.



## 2.7 Inspect valve guides

### Special tools and workshop equipment required

- ♦ Universal dial gauge holder -MP3-447 (VW 387)-
- ♦ Dial gauge

### Test sequence

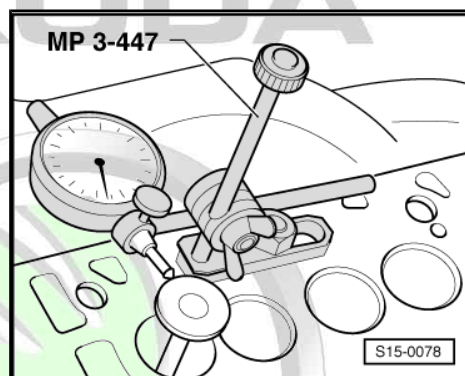
- Insert valve into valve guide. End of valve stem must be flush with guide.

Valve rock: max. 1.3 mm.



### Note

- ♦ If the wear limit is exceeded, repeat measurement with new valves. If the wear limit is again exceeded, replace cylinder head. The valve guides cannot be replaced.
- ♦ If the valves are replaced when carrying out repair work, use new valves for the measurement.



## 2.8 Reworking valve seats

If no perfect contact pattern is achieved by grinding in the valve seats, rework the valve seats.

### Special tools and workshop equipment required

- ♦ Depth gauge
- ♦ Caliper gauge
- ♦ Device for reworking valve seats

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



## Note

- ◆ When carrying out repairs on engines with leaking valves, it is not sufficient to replace the valves and to rework the valve seats. It is also necessary to inspect the valve guides for wear, particularly on engines with a high mileage ➔ [page 82](#).
- ◆ Calculate the maximum permissible reworking dimension before reworking the valve seats.
- ◆ Rework valve seats only sufficiently in order to obtain a proper contact pattern.
- ◆ If the maximum permissible reworking dimension is exceeded, proper operation of the hydraulic valve clearance compensation is no longer assured and the cylinder head should be replaced.

## Calculating maximum permissible reworking dimension

- Insert valve into the guide and press forcefully against the valve seat.



## Note

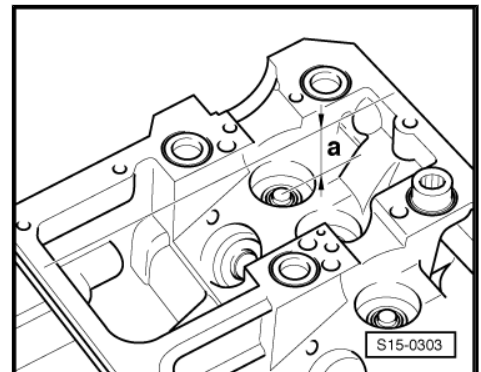
If a valve is replaced when carrying out repair work, use a new valve for the measurement.

- Measure distance -a- between the end of the valve stem and the upper face of the cylinder head with a depth gauge.
- Calculate max. permissible reworking dimension from the distance measured and the minimum dimension.
- ◆ Minimum dimension of inlet valve: 43.4 mm
- ◆ Minimum dimension of outlet valve 43.2 mm

Measured distance less minimum dimension = max. permissible reworking dimension.

### Example for inlet valve:

|                                        |           |
|----------------------------------------|-----------|
| Measured distance                      | 44.1 mm   |
| - Minimum dimension                    | - 43.4 mm |
| = max. permissible reworking dimension | = 0.7 mm  |



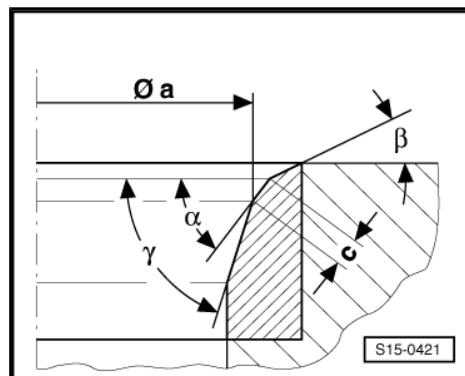
## Note

If the max. permissible reworking dimension is 0 mm and/or less than 0 mm, repeat measurement with a new valve. If the measuring result is still 0 mm and/or less than 0 mm, replace cylinder head.

### Reworking inlet valve seat

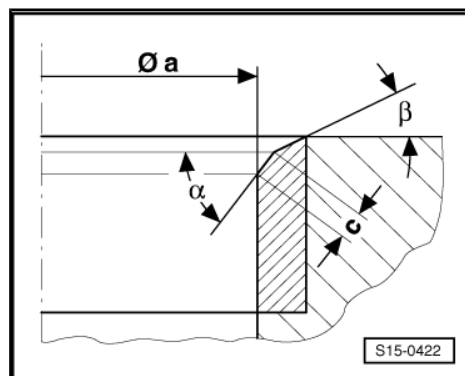
| Di-<br>men-<br>sion | Inlet valve seat            |      |
|---------------------|-----------------------------|------|
| $\varnothing a$     | mm                          | 33,5 |
| c                   | mm                          | 1,5  |
| $\alpha$            | 45° valve seat angle        |      |
| $\beta$             | 15° top correction angle    |      |
| $\gamma$            | 60° bottom correction angle |      |

Due to the flow in the air intake channel, it is absolutely essential to chamfer the 30° valve seat lower edge.



### Reworking exhaust valve seat

| Di-<br>men-<br>sion | Exhaust valve seat       |      |
|---------------------|--------------------------|------|
| $\varnothing a$     | mm                       | 27,5 |
| c                   | mm                       | 2,0  |
| $\alpha$            | 45° valve seat angle     |      |
| $\beta$             | 15° top correction angle |      |



### Procedure

Reworking can be carried out by hand while complying with the following conditions:

- Wear limit of valve guides must not exceed the permissible dimension ⇒ [page 83](#).
- Use NAC milling cutter with carbide metal tips (min. 90 HRC).
- Mill with the milling cutter using slight pressure in such a way that an even removal of swarfs is ensured over the whole working surface.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



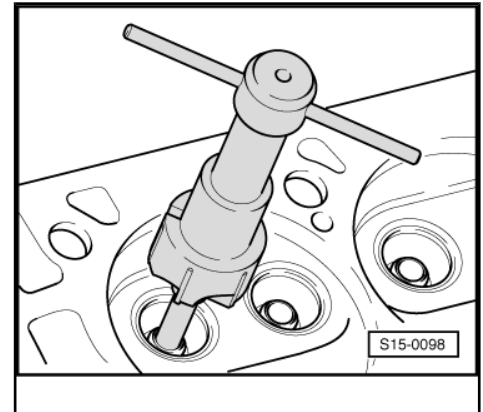
### Mill valve seats with NAC milling cutter

- Place cylinder head on a felt base and secure to prevent it from turning.
- Match diameter of guide drift to diameter of valve guides.

| Valve guide   | Ø Guide drift in mm |
|---------------|---------------------|
| Inlet valve   | 7,0 -0,01           |
| Exhaust valve |                     |

- Match diameter of milling cutter to diameter of valve.

| Valve seat             | Ø Milling cutter 90 mm | Ø Milling cutter 150 mm | Ø Milling cutter 60 mm |
|------------------------|------------------------|-------------------------|------------------------|
| Inlet valve Ø 36 mm    | 36                     | 37                      | 21/34                  |
| Outlet valve Ø 31.5 mm | 32                     | 33                      |                        |



### Mill inlet valve seat

- Mill valve seat with 90° milling tool until a perfect contact pattern is achieved. (Do not exceed maximum permissible reworking dimension!)
- Chamfer bottom correction angle with 60° milling cutter until the valve seat diameter -a- ➔ [page 84](#) is achieved.
- Mill bottom correction angle with 150° milling cutter until valve seat width -c- is achieved ➔ [page 84](#).

### Mill outlet valve seat

- Mill valve seat with 90° milling tool until a perfect contact pattern is achieved. (Do not exceed maximum permissible reworking dimension!)

- Measure achieved valve seat width with caliper gauge:

Specified value: 2.0 mm

If the measured dimension is less than the nominal value:

- Chamfer valve seat with 90° milling cutter until valve seat width -c- is achieved ➔ [page 84](#). (Do not exceed maximum permissible reworking dimension!)

If the measured dimension is more than the nominal value:

- Mill bottom correction angle with 150° milling cutter until valve seat width -c- is achieved ➔ [page 84](#).

### Grinding in valves



- Grind in valves with fine grinding paste so as to achieve a perfect contact pattern of the valve and valve seat -arrows-.
- Check contact pattern e.g. with water colour (perfect contact pattern over entire circumference).
- Install valve springs and check the tightness of the valves by filling petrol into the inlet and outlet canals (no petrol must flow out at the valve seat)

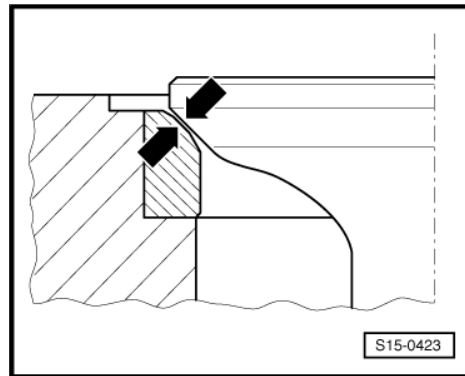
#### Inspection

- After the repair measure the dimension -h- again and calculate the maximum permissible reworking dimension ➤ [page 82](#) .



#### Note

*If the maximum permissible reworking dimension was exceeded, the cylinder head must be replaced as the proper operation of the valve gear is no longer assured.*



# ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 17 – Lubrication

### 1 Removing and installing parts of the lubrication system

#### Note

- ◆ *If considerable quantities of metal swarf or abrasion is found in the engine oil when carrying out engine repairs, carefully clean the oil galleries and additionally replace the oil cooler.*
- ◆ *The oil level must not exceed max. marking! - Risk of damage to catalytic converter!*

Check the engine oil, amount of oil and oil specification ⇒ Maintenance ; Octavia II .

1 - 15 Nm

2 - 15 Nm

3 - Support

- ☐ for cable of oil level and oil temperature sender - G266 -
- ☐ pay attention to different version

4 - Sprocket

5 - Dipstick

- ☐ oil level must not exceed max. marking

6 - Filler funnel

- ☐ Remove for extracting oil

7 - Guide tube

8 - Oil injection nozzle

- ☐ for cooling pistons
- ☐ pay attention to Part No. (right-angle bend)

9 - Pressure relief valve, 27 Nm

- ☐ opens at 0.25 to 0.32 MPa overpressure
- ☐ replace without sealant

10 - O-ring

- ☐ replace

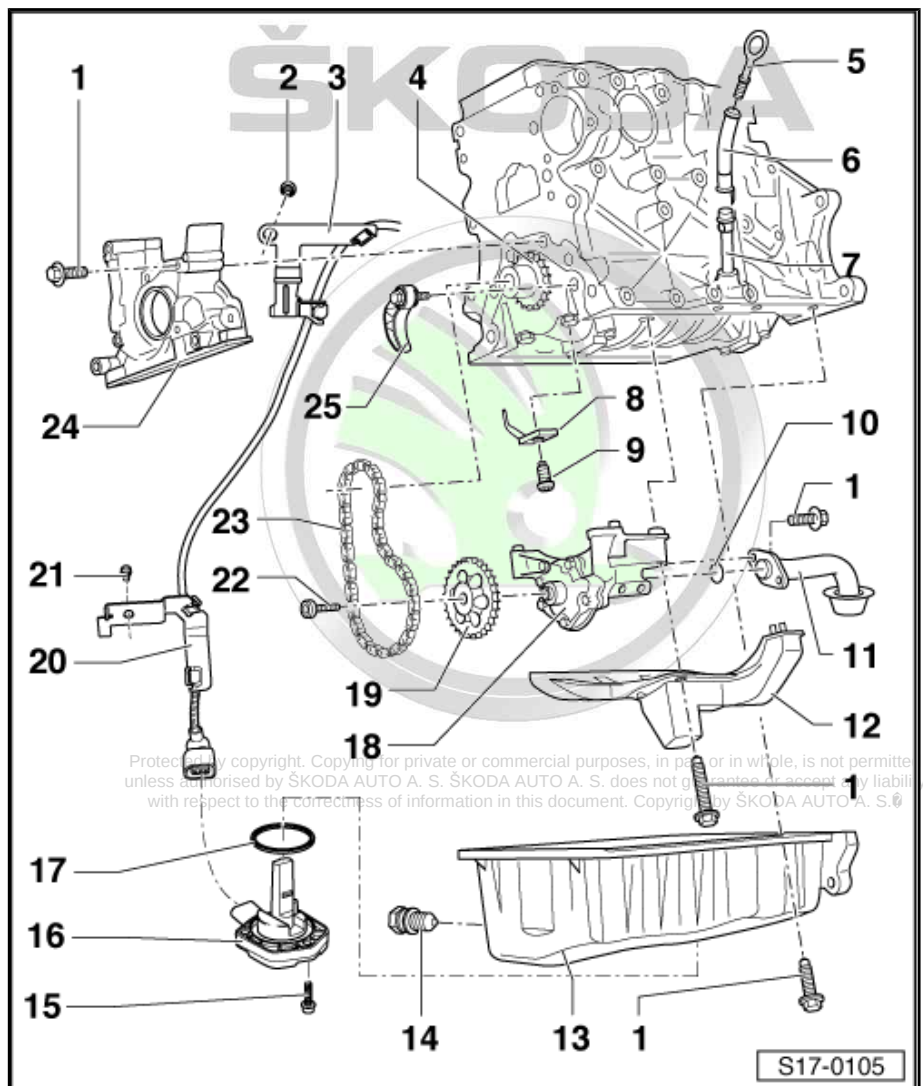
11 - Suction line

- ☐ Clean strainer if dirty

12 - Baffle

13 - Oil pan

- ☐ removing and installing ⇒ [page 90](#)
- ☐ install with silicone sealant -D 176 600 A1-



**14 - Oil drain plug - 30°Nm**

- ☐ with integrated gasket ring
- ☐ replace

**15 - 10 Nm**

- ☐ replace

**16 - Oil level/oil temperature sensor -G266-**

- ☐ check ⇒ Vehicle diagnosis, testing and information system VAS 5051

**17 - O-ring**

- ☐ replace

**18 - Oil pump**

- ☐ with pressure relief valve 1.2 MPa (12 bar)
- ☐ removing and installing ⇒ [page 92](#)
- ☐ Before installing, check whether both dowel sleeves for centering oil pump/cylinder block are present
- ☐ if there is any scoring on contact surfaces and gears, replace
- ☐ Tightening torque of oil pump cover at oil pump housing: 10 Nm

**19 - Oil pump sprocket**

- ☐ Fits onto oil pump shaft in one position only

**20 - Bracket at bottom**

- ☐ for cable to oil level/oil temperature sender

**21 - 15 Nm**

Reproduction, copying, distribution, or use for other purposes, in part or in whole, is not permitted unless authorised by SKODA AUTO A. S. SKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by SKODA AUTO A. S. ©

**22 - 20 Nm + torque a further 90° (1/4 turn)**

- ☐ replace

**23 - Oil pump chain**

- ☐ before removing mark running direction
- ☐ check for wear

**24 - Sealing flange on the belt pulley side**

- ☐ replace the gasket ring for the crankshaft - on the belt pulley side ⇒ [page 36](#)
- ☐ removing and installing ⇒ [page 37](#)

**25 - Chain tensioner**

- ☐ do not disassemble
- ☐ Replace chain tensioner if spring is broken.
- ☐ Check fitting position
- ☐ When installing, hook on the spring and pretension
- ☐ tighten to 16 Nm

## 1.1 Overview of the filter holder

### 1 - Screw plug - 25 Nm

### 2 - Gasket

- ☐ replace

### 3 - Oil cooler

- ☐ pay attention to the necessary replacement
- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

### 4 - Gasket

- ☐ replace
- ☐ Fitting position  
⇒ [page 90](#)

### 5 - 15 Nm + torque a further 90° (1/4 turn)

- ☐ replace
- ☐ tighten crosswise

### 6 - Gasket

- ☐ replace

### 7 - Oil filter holder

- ☐ with oil retaining valve
- ☐ Oil retaining valve cannot be replaced individually.

### 8 - Gasket ring

- ☐ replace

### 9 - Oil pressure switch -F1-- 20 Nm

- ☐ 0.07 MPa (0.7 bar) switch
- ☐ check ⇒ [page 92](#)

### 10 - Screw cap - 25 Nm

- ☐ loosen and tighten up with the oil filter spanner -3417-

### 11 - O-ring

- ☐ replace

### 12 - Oil filter element

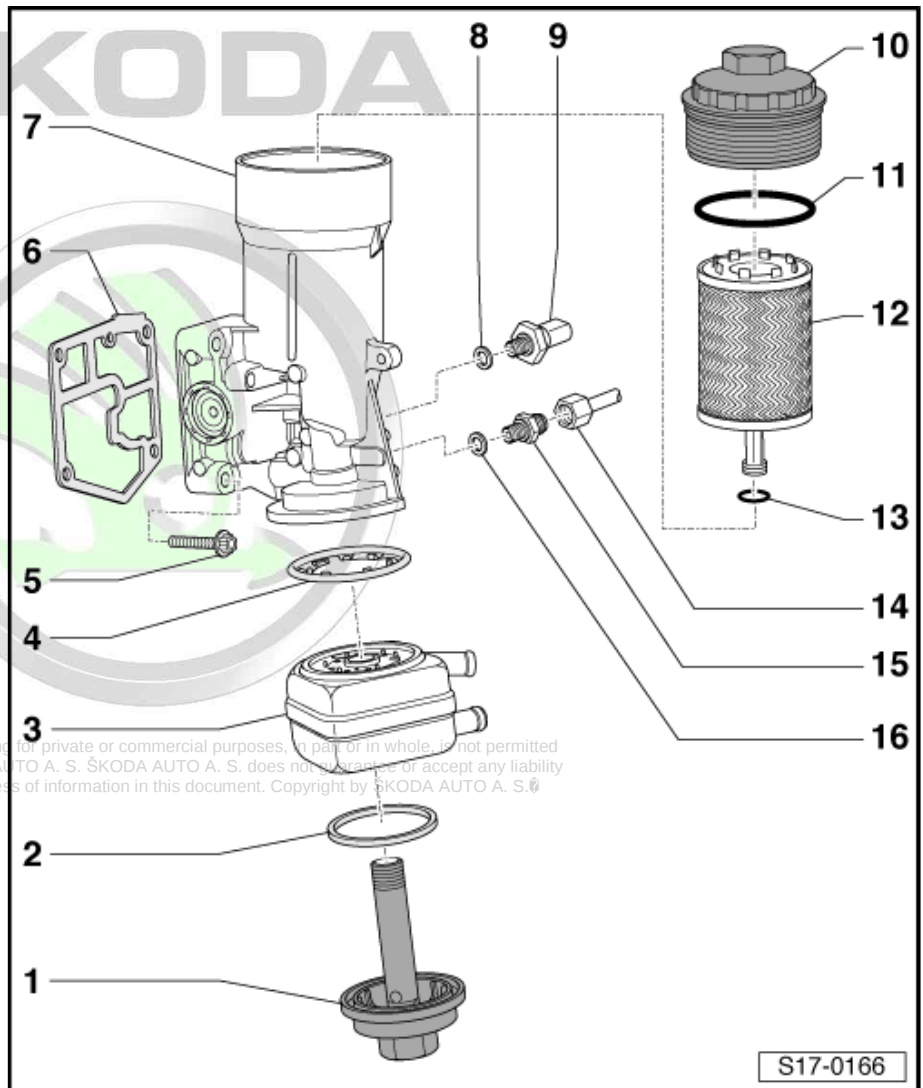
- ☐ pull off from cap - Pos. 10
- ☐ Replace O-rings Pos. 11 and Pos. 13 if oil filter element is changed
- ☐ Check fitting position
- ☐ pay attention to change intervals ⇒ Maintenance ; Octavia II.

### 13 - O-ring

- ☐ replace

### 14 - Oil feed line

- ☐ to exhaust gas turbocharger
- ☐ Observe the mounting sequence:
  - Screw on the union nuts first of all by hand.
  - Then tighten the union nuts to 22 Nm.





- Subsequently secure the oil feed line in the brackets.

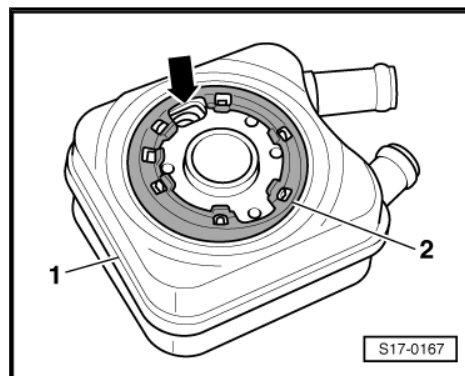
## 15 - Connection fittings - 35 Nm

## 16 - Gasket ring

- ☐ replace

### Fitting position of gasket for oil cooler

- Place the gasket -2- in such a way that it can be pressed onto all the lugs of the oil cooler -1-.
- The oil duct -arrow- must not be covered from the gasket.



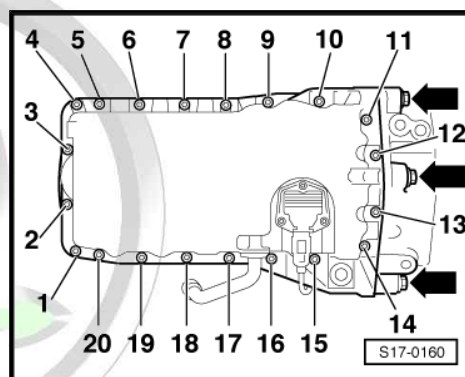
## 1.2 Removing and installing oil pan

### Special tools and workshop equipment required

- ♦ Socket insert -T10058- or -Steckeinsatz SW 5 - , e.g. -3249-
- ♦ Sealant remover gasket stripper (bearing code GST, bearing article no. R 34402), manufacturer Retech s.r.o.
- ♦ Cleaning and degreasing agent , e.g. -D 000 401 04-
- ♦ Protective goggles and gloves
- ♦ Silicone sealant -D 176 404 A2-

### Removing

- Remove the middle and right sound dampening system ⇒ Body Work ⇒ Rep. Gr. 50 .
- Remove right air guide pipe, to do so pull the retaining clips.
- Disconnect plug at oil level and oil temperature sender - G266- .
- Drain engine oil ⇒ Maintenance ; Octavia II .
- Unscrew the bolts of oil pan/gearbox -arrows-.
- Loosen bolts -1 ... 20- crosswise and release.
- Remove oil pan, if necessary release by applying slight blows with a rubber-headed hammer.



**i Note**

*Both rear oil pan bolts -1- and -2- are accessible through the recess -arrow- at the flywheel -3-, turn the flywheel appropriately to allow this.*

**Install**

Installation is performed in the reverse order, pay attention to the following points:



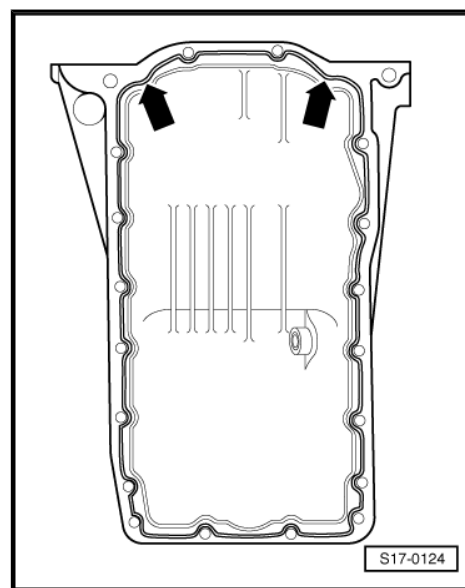
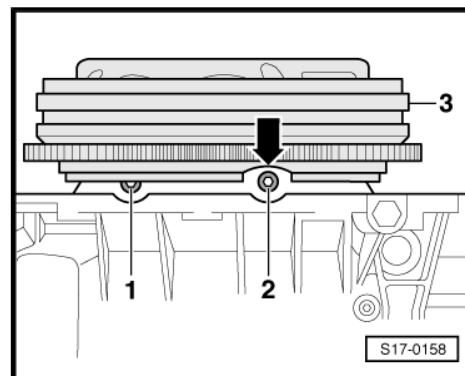
**WARNING**

***Wear protective gloves when working with sealant and grease remover!***

- Clear sealing surface on the oil pan from gasket residues with chemical sealant remover.
- Degrease the sealing surfaces.
- Cut off nozzle tube at the front marking ( $\varnothing$  of nozzle approx. 3 mm).
- Apply silicone sealant bead -arrow- to the clean sealing surface of the oil pan, as shown.
- Thickness of sealant bead: 2 ... 3 mm.

**i Note**

- ◆ *The sealant bead must not be thicker than 3 mm otherwise excess sealant may get into the oil pan and clogg the strainer in the oil suction pipe.*
- ◆ *Take particular care when applying the sealant bead in the area of the sealing flange at the rear -arrows-.*
- ◆ *The oil pan must be installed within 5 minutes after applying the silicone sealant.*

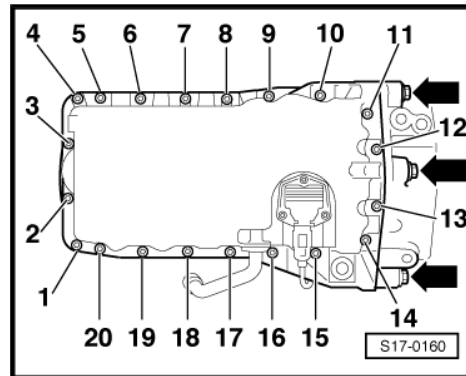


- Fit on the oil pan immediately and tighten the bolts as follows:
- First of all tighten bolts -1 ... 20- crosswise to 5 Nm.
- Tighten the bolts of the oil pan/gearbox -arrows- to a torque of 45 Nm.
- Tighten bolts -1...20- crosswise to 15 Nm.



#### Note

- ◆ *When installing the oil pan with the engine removed, ensure that the oil pan is flush with the cylinder block at the flywheel side.*
- ◆ *After installing the oil pan, allow the sealant to dry for about 30 minutes. Only then may engine oil be filled in.*
- Fill with engine oil and check the oil level ⇒ Maintenance ; Octavia II .



## 1.3 Removing and installing oil pump

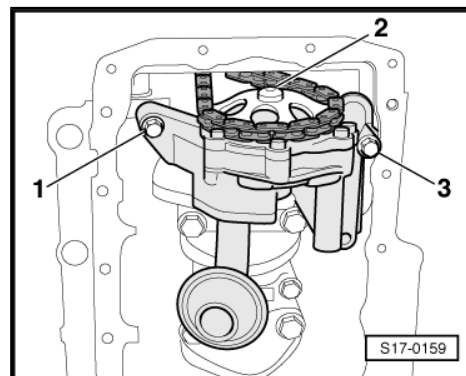
### Removing

- Remove oil pan ⇒ [page 90](#) and baffle ⇒ [Item 12 \(page 87\)](#) .
- Release screw -2-.
- Pull the chain sprocket off the oil pump shaft.
- Release screws -1- and -3- and remove oil pump.

### Install

Installation is performed in the reverse order, pay attention to the following points:

- Insert top dowel sleeves into the oil pump.
- Installed position of the oil pump shaft/chain sprocket: Chain sprocket fits onto the shaft in one position only.
- Install oil pan ⇒ [page 90](#) and baffle ⇒ [Item 12 \(page 87\)](#) .



## 1.4 Testing oil pressure and oil pressure switch

### Special tools and workshop equipment required

- ◆ Oil pressure tester , e. g. -V.A.G 1342-
- ◆ Voltage tester , e. g. -V.A.G 1527 B-
- ◆ Measuring tool set -V.A.G 1594 C-

### Test conditions

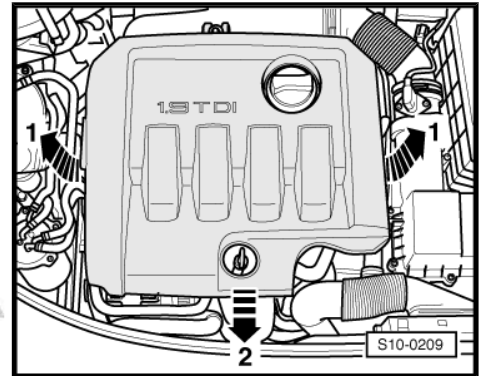
- Oil level o.k.
- Engine oil temperature approx. 80 C.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

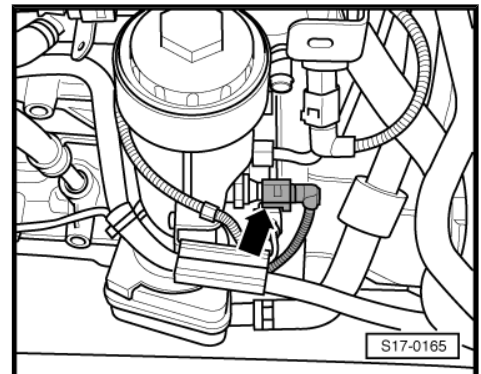
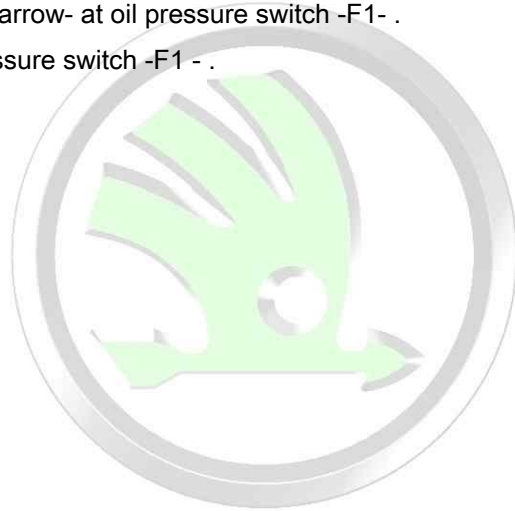


- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.

ŠKODA



- Disconnect plug -arrow- at oil pressure switch -F1- .
- Screw out oil pressure switch -F1- .



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

- Screw the oil pressure tester (e. g. -V.A.G 1342- ) into the hole for the oil pressure switch.
- Screw oil pressure switch -2- into oil pressure tester (e. g. - V.A.G 1342 - ).

#### Testing oil pressure switch

- Connect brown cable -1- of oil pressure tester to earth (-).
- Unclamp the voltage tester with its auxiliary cables out of the measuring tool set on the oil pressure switch and plus (+) terminal of the battery.
- The LED should not light up.

If the LED lights up:

- Replace oil pressure switch.
- Start engine.



#### Note

*Observe the testing equipment and the LED while actuating the starter since the switching point of the oil pressure switch can already be exceeded when starting up.*

- At an overpressure of 0.055 ... 0.085 (0.55 ... 0.85 bar) the LED should light up.

If the LED does not light up:

- Replace oil pressure switch.

#### Testing oil pressure

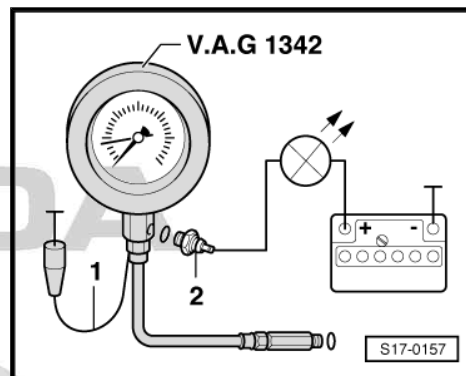
- Start engine.
- Oil pressure when engine idling: at least 0.08 MPa (0.8 bar).
- Oil pressure at 2000 rpm: min. 0.2 MPa (2.0 bar).

If the specified values are not reached: Oil pump defective.

- Replace oil pump.
- Oil pressure at a higher engine speed: max. 0.7 MPa (7.0 bar).

If the specified value is exceeded: Pressure relief valve defective.

- Replace oil filter holder.





## 19 – Cooling

### 1 Removing and installing parts of the cooling system



#### WARNING

*Hot steam or hot coolant may escape when the compensation bottle is opened. Cover the cap with a cloth and open carefully.*



#### Note

- ◆ *When the engine is warm the cooling system is under pressure. If necessary reduce pressure before repairs.*
- ◆ *Secure all hose connections with corresponding hose clips.*
- ◆ *Use pliers for spring strap clips to fit the spring strap clips.*
- ◆ *Always replace seals and gasket rings.*

#### 1.1 Parts of the cooling system fitted to body

##### 1.1.1 Summary of components for engine with engine identification characters BJB, BKC, BXE



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



**1 - Top coolant hose**

- ☐ To connection fitting at cylinder head

**2 - O-ring**

- ☐ replace

**3 - Radiator**

- ☐ removing and installing  
⇒ [page 112](#)
- ☐ after replacing fill entire system with fresh coolant

**4 - Gasket**

**5 - Screw cap**

**6 - Connector**

**7 - 2 Nm**

**8 - Expansion reservoir**

- ☐ check the coolant system for tightness  
⇒ [page 114](#)
- ☐ test pressure 0.14...0.16 MPa (1.4...1.6 bar) - positive pressure

**9 - 5 Nm**

**10 - 10 Nm**

**11 - Right radiator fan - V35-**

- ☐ removing and installing  
⇒ [page 113](#)

**12 - Radiator fan - V7-**

- ☐ with radiator fan control unit -J293-
- ☐ removing and installing ⇒ [page 113](#)

**13 - Fan shroud**

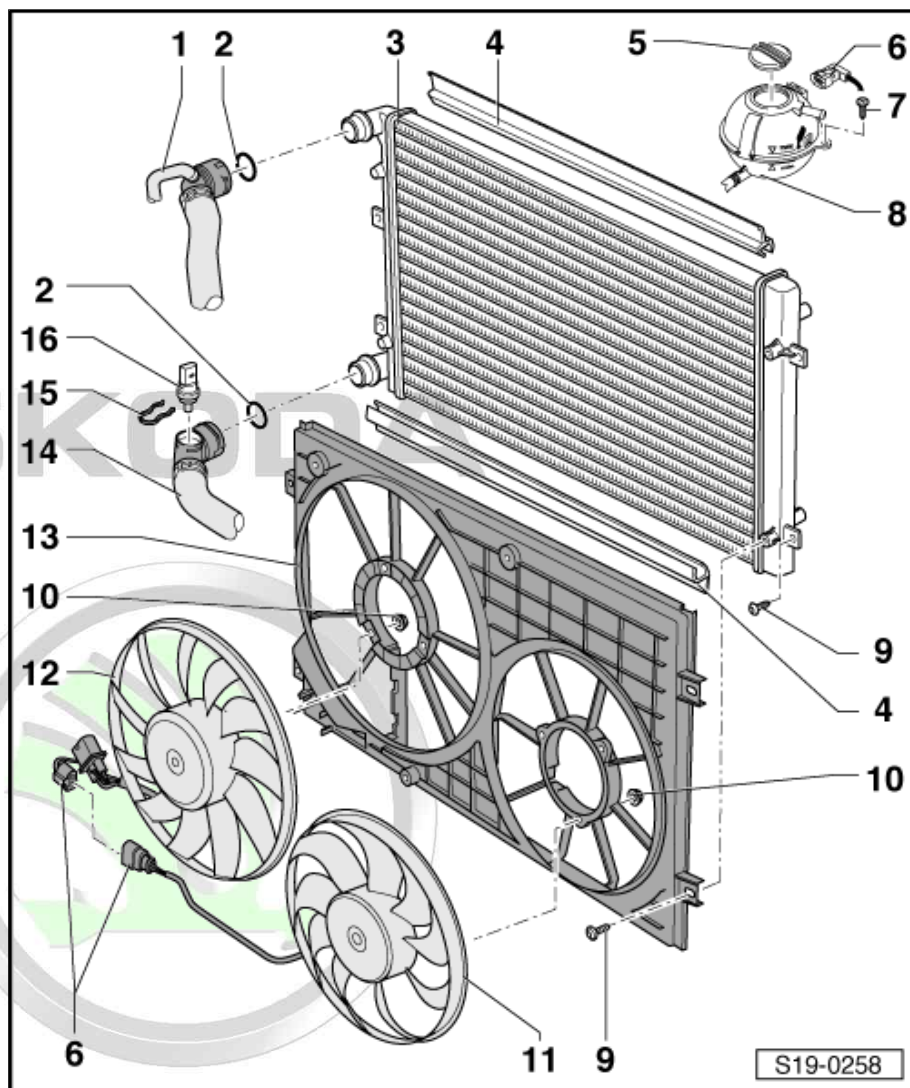
**14 - Bottom coolant hose**

- ☐ To connection fitting at coolant regulator

**15 - Retaining clip**

**16 - Coolant temperature sender at radiator outlet -G83-**

- ☐ replace the O-ring if it is damaged



## 1.1.2 Summary of components for engine with identification characters BLS

### 1 - Radiator fan - V7-

- ☐ with radiator fan control unit -J293-
- ☐ removing and installing ⇒ [page 113](#)

### 2 - 10 Nm

### 3 - Fan shroud

### 4 - Top coolant hose

- ☐ To connection fitting at cylinder head
- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

### 5 - O-ring

- ☐ replace if damaged

### 6 - Radiator

- ☐ removing and installing ⇒ [page 112](#)
- ☐ after replacing fill entire system with fresh coolant ⇒ [page 106](#)

### 7 - 5 Nm

### 8 - O-ring

- ☐ replace if damaged

### 9 - Bottom coolant hose

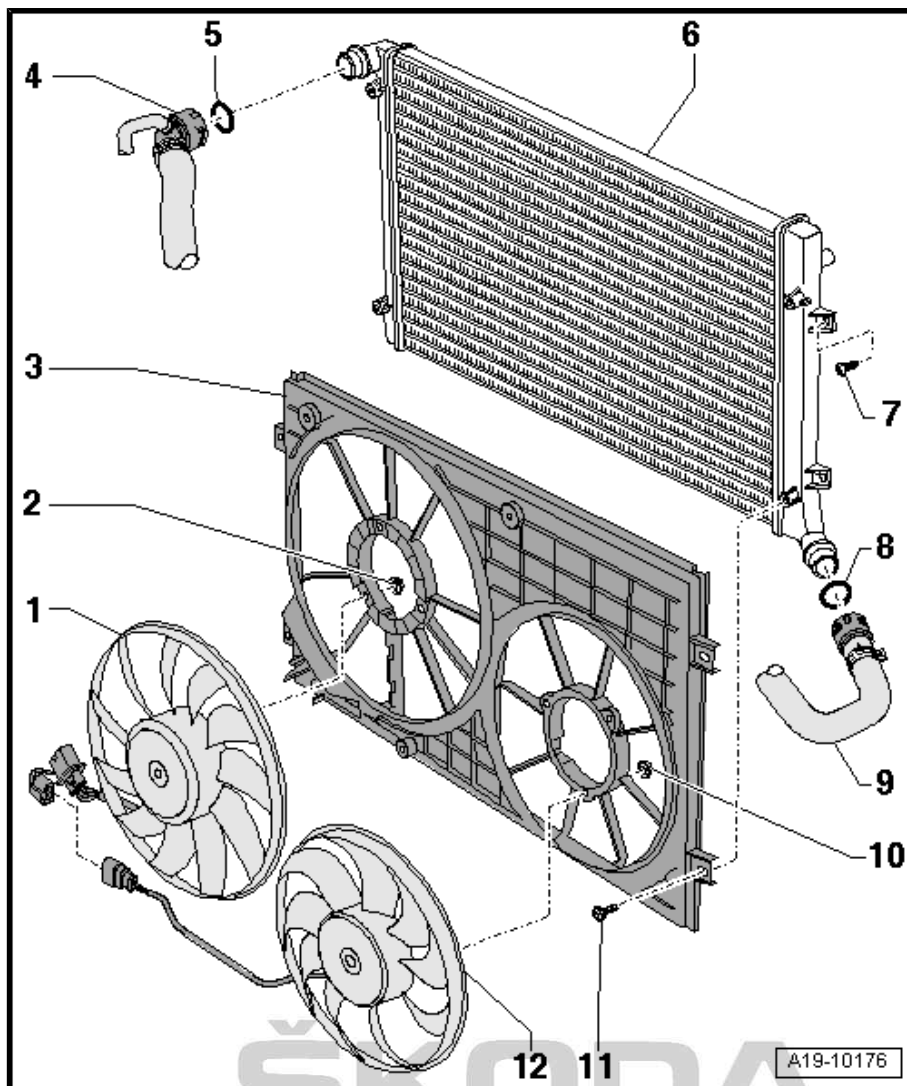
- ☐ to connection fitting of coolant regulator at block
- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

### 10 - 10 Nm

### 11 - 5 Nm

### 12 - Right radiator fan - V35-

- ☐ removing and installing ⇒ [page 113](#)



## 1.2 Parts of cooling system engine side

### 1.2.1 Summary of components for engine with identification characters BJB

1 - to the compensation bottle above

- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

2 - Top coolant pipe

- ☐ screwed onto the cylinder head cover

3 - O-ring

- ☐ replace

4 - Retaining clip

- ☐ check tightness

5 - Coolant temperature sender - G62-

6 - to heat exchanger

- ☐ Feed line
- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

7 - Connection fittings

- ☐ for cylinder head

8 - 10 Nm

9 - to heat exchanger

- ☐ Return-flow line
- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

10 - 40 Nm

11 - Distributor part

12 - towards top radiator

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

13 - 15 Nm

14 - to bottom compensation bottle

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

15 - Coolant pipe

16 - to bottom radiator

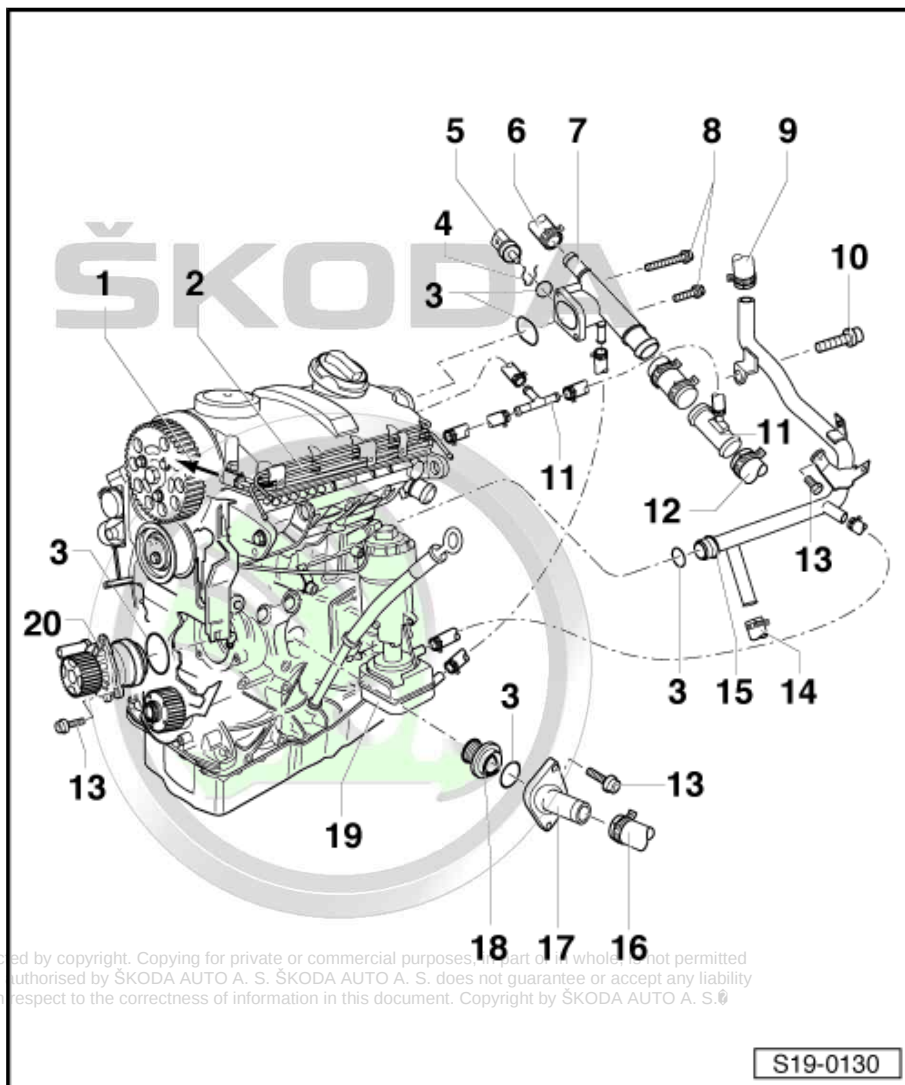
- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

17 - Connection fittings

- ☐ for coolant regulator

18 - Coolant regulator

- ☐ removing and installing ⇒ [page 110](#)
- ☐ check: heat up regulator in a water bath
- ☐ Start of opening approx. 87 °C
- ☐ Full opening approx. 102°C



- ☐ Stroke min. 7 mm

#### 19 - Oil cooler

- ☐ removing and installing ⇒ [page 89](#)

#### 20 - Coolant pump

- ☐ check smooth operation
- ☐ Check fitting position
- ☐ removing and installing ⇒ [page 109](#)

## 1.2.2 Summary of components for engine with identification characters BKC, BXE

### 1 - Exhaust gas recirculation radiator

- ☐ removing and installing ⇒ [page 197](#)

### 2 - to heat exchanger

- ☐ Feed line
- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

### 3 - to changeover valve of radiator for exhaust gas recirculation

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

### 4 - O-ring

- ☐ replace

### 5 - Retaining clip

- ☐ check tightness

### 6 - Coolant temperature sender - G62-

### 7 - to exhaust gas recirculation radiator

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

### 8 - Connection fittings

- ☐ for cylinder head

### 9 - 10 Nm

### 10 - to heat exchanger

- ☐ Return-flow line
- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

### 11 - 40 Nm

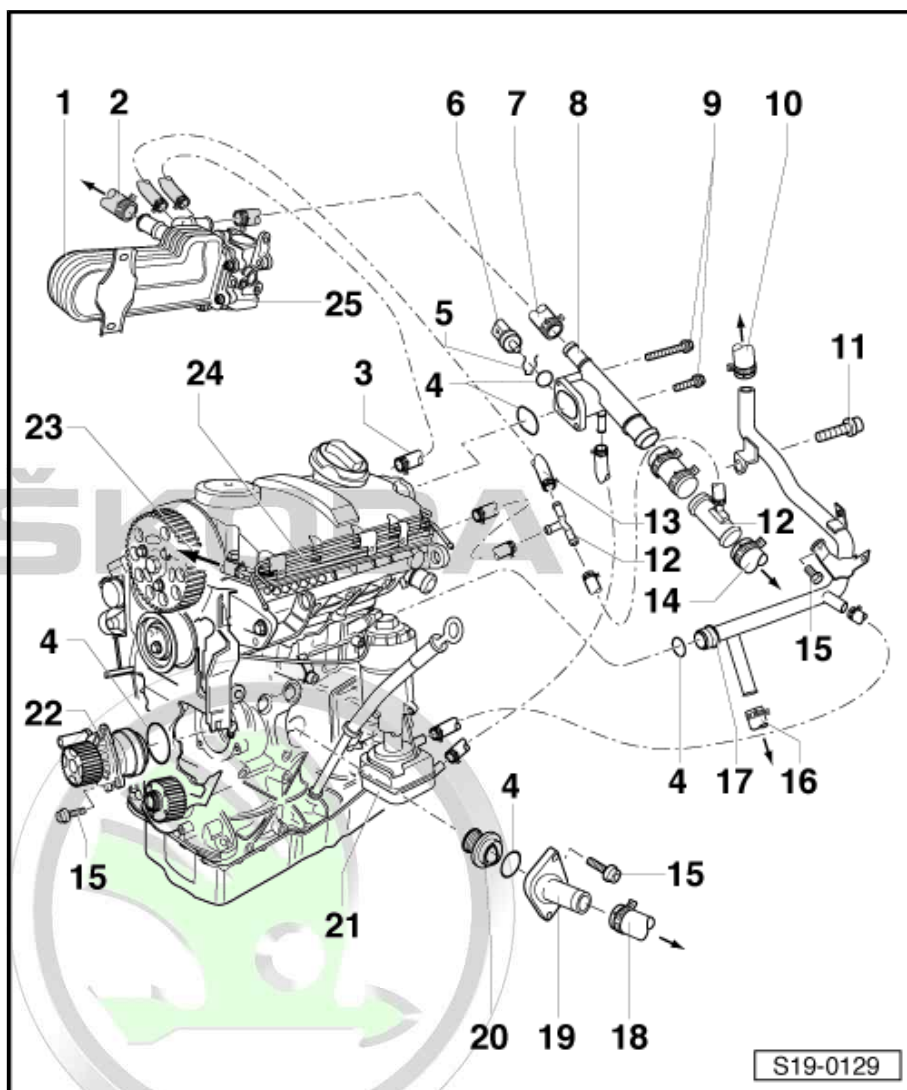
### 12 - Distributor part

### 13 - from changeover valve of radiator for exhaust gas recirculation

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

### 14 - towards top radiator

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.



**15 - 15 Nm****16 - to bottom compensation bottle**

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

**17 - Coolant pipe****18 - to bottom radiator**

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

**19 - Connection fittings**

- ☐ for coolant regulator

**20 - Coolant regulator**

- ☐ removing and installing ⇒ [page 110](#)
- ☐ check: heat up regulator in a water bath
- ☐ Start of opening approx. 87 °C
- ☐ Full opening approx. 102°C
- ☐ Stroke min. 7mm

**21 - Oil cooler**

- ☐ removing and installing ⇒ [page 89](#)

**22 - Coolant pump**

- ☐ check smooth operation
- ☐ Check fitting position
- ☐ removing and installing ⇒ [page 109](#)

**23 - to the compensation bottle above**

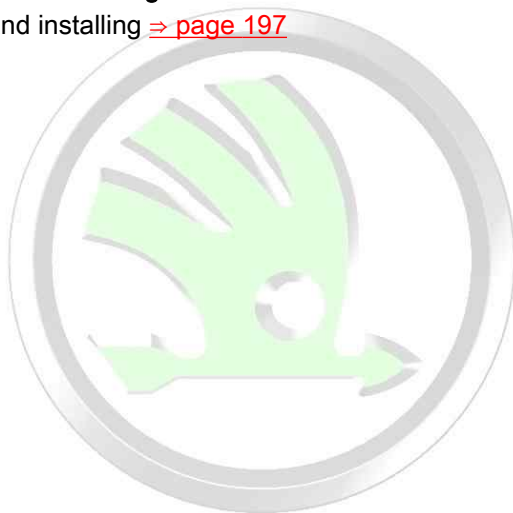
- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

**24 - Top coolant pipe**

- ☐ screwed onto the cylinder head cover

**25 - Radiator flap for exhaust gas recirculation**

- ☐ removing and installing ⇒ [page 197](#)



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

### 1.2.3 Summary of components for engine with identification characters BLS

1 - to the compensation bottle above

- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

2 - Top coolant pipe

- ☐ screwed onto the cylinder head cover

3 - O-ring

- ☐ replace

4 - Retaining clip

- ☐ check tightness

5 - Coolant temperature sender - G62-

6 - to exhaust gas recirculation radiator

- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

7 - Connection fittings

- ☐ for cylinder head

8 - 10 Nm

9 - towards top radiator

- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

10 - from heat exchanger

- ☐ Return-flow line
- ☐ connection diagram for coolant hoses  
⇒ [page 103](#)

11 - 40 Nm

12 - Distributor part

13 - from distributor part of top coolant hose

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

14 - 15 Nm

15 - from the expansion reservoir below

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

16 - Coolant pipe

17 - Gasket ring

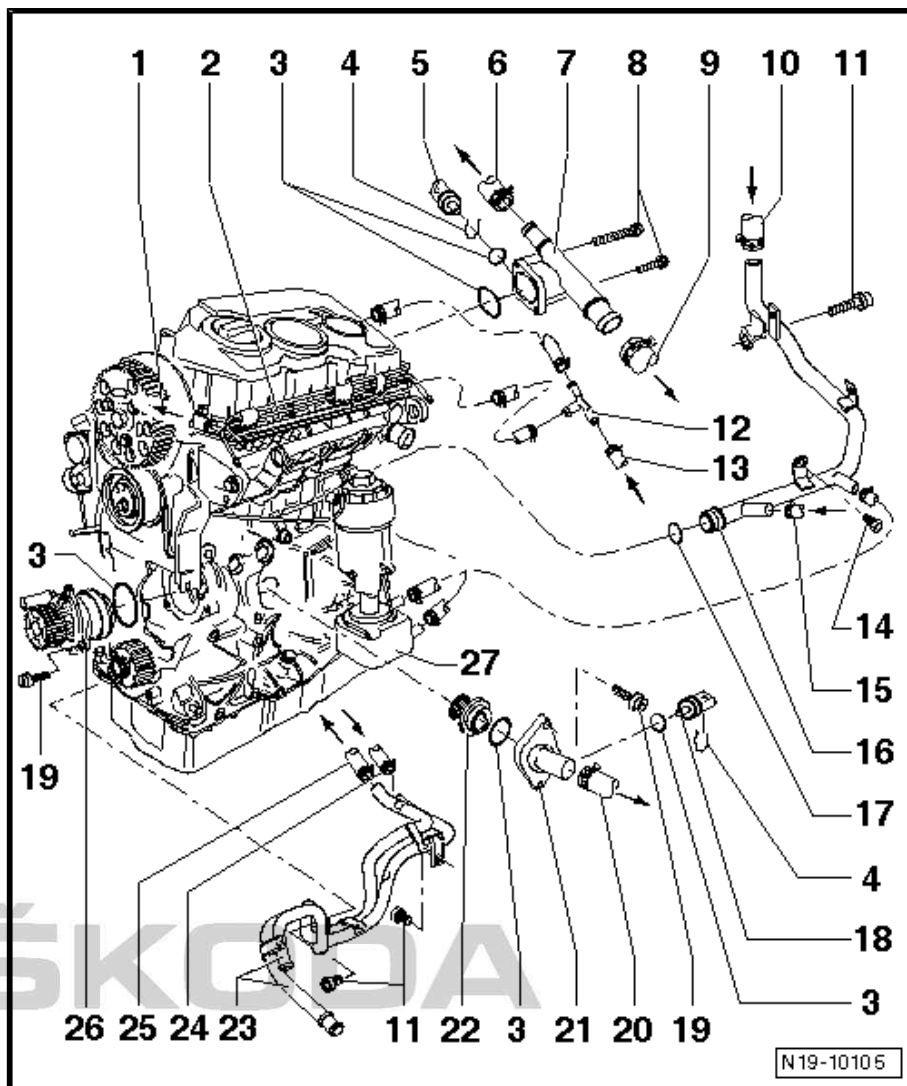
- ☐ replace

18 - Coolant temperature sender at radiator outlet -G83-

19 - 15 Nm

20 - to bottom radiator

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)





## 21 - Connection fittings

- ☐ for coolant regulator

## 22 - Coolant regulator

- ☐ removing and installing ⇒ [page 110](#)
- ☐ check: heat up regulator in a water bath
- ☐ Start of opening approx. 87 °C
- ☐ Full opening approx. 102°C
- ☐ Stroke min. 7 mm

## 23 - The coolant pipe at the rear

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

## 24 - from exhaust gas recirculation radiator

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

## 25 - to heat exchanger

- ☐ connection diagram for coolant hoses ⇒ [page 103](#)

## 26 - Coolant pump

- ☐ check smooth operation
- ☐ Check fitting position
- ☐ removing and installing ⇒ [page 109](#)

## 27 - Oil cooler

- ☐ removing and installing ⇒ [page 89](#)

# SKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 1.3 Connection diagram for coolant hoses

### 1.3.1 Engine with engine identification characters BJB

#### 1 - Radiator

- ☐ removing and installing  
⇒ [page 112](#)
- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)

#### 2 - Oil cooler

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)
- ☐ removing and installing  
⇒ [page 89](#)

#### 3 - Coolant regulator

- ☐ removing and installing  
⇒ [page 110](#)
- ☐ check: heat up regulator in a water bath
- ☐ Start of opening approx. 87 °C
- ☐ Full opening approx. 102 °C
- ☐ Stroke min. 7 mm

#### 4 - Coolant pump

- ☐ removing and installing  
⇒ [page 109](#)

#### 5 - Cylinder head/cylinder block

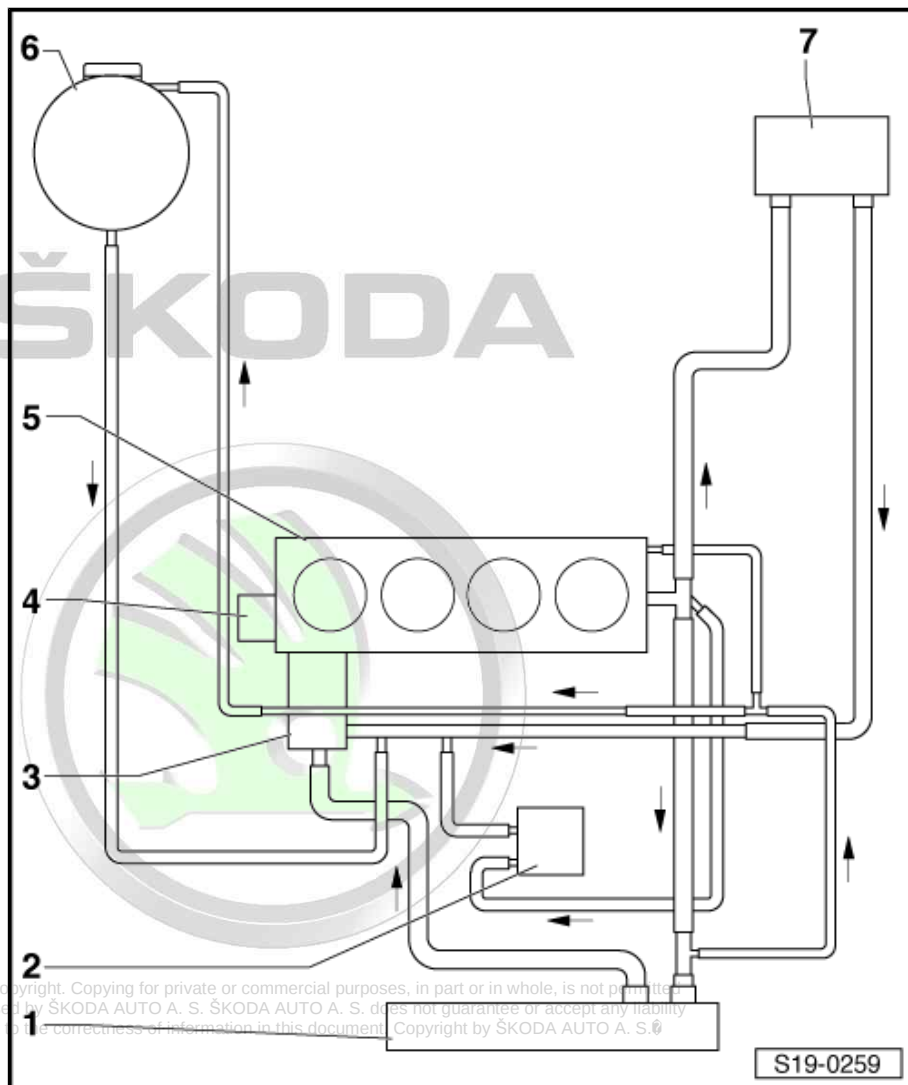
- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)

#### 6 - Expansion reservoir

- ☐ with cap
- ☐ Testing the pressure relief valve in the cap ⇒ [page 114](#)

#### 7 - Heat exchanger for heating

- ☐ fill with fresh coolant after replacing ⇒ [page 106](#)



## 1.3.2 Engine with engine identification characters BKC, BXE

For vehicles without auxiliary heating.

### 1 - Radiator

- ☐ removing and installing  
⇒ [page 112](#)
- ☐ fill with fresh coolant after replacing

### 2 - Oil cooler

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)
- ☐ removing and installing  
⇒ [page 89](#)

### 3 - Coolant regulator

- ☐ removing and installing  
⇒ [page 110](#)
- ☐ check: heat up regulator in a water bath
- ☐ Start of opening approx. 87 °C
- ☐ Full opening approx. 102°C
- ☐ Stroke min. 7 mm

### 4 - Coolant pump

- ☐ removing and installing  
⇒ [page 109](#)

### 5 - Cylinder head/cylinder block

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)

### 6 - Expansion reservoir

- ☐ with cap
- ☐ Testing the pressure relief valve in the cap  
⇒ [page 114](#)

### 7 - Exhaust gas recirculation radiator

- ☐ fill with fresh coolant after replacing
- ☐ removing and installing ⇒ [page 197](#)

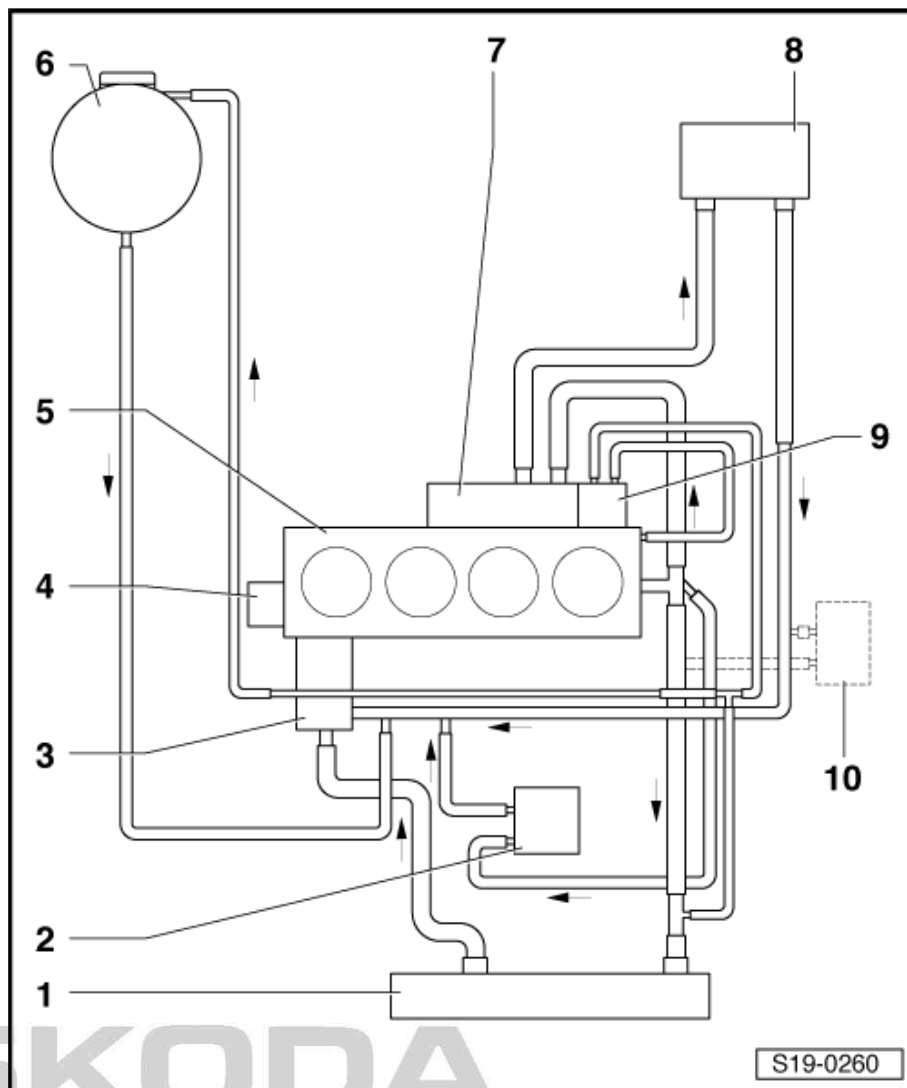
### 8 - Heat exchanger for heating

- ☐ fill with fresh coolant after replacing ⇒ [page 106](#)

### 9 - Radiator flap for exhaust gas recirculation

### 10 - ATF radiator

- ☐ for models with an automatic gearbox
- ☐ fill with fresh coolant after replacing ⇒ [page 106](#)



For vehicles with auxiliary heating



### 1 - Radiator

- ☐ removing and installing  
⇒ [page 112](#)
- ☐ fill with fresh coolant after replacing

### 2 - Oil cooler

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)
- ☐ removing and installing  
⇒ [page 89](#)

### 3 - Coolant pump/coolant regulator

- ☐ removing and installing  
⇒ [page 110](#)
- ☐ check: heat up regulator in a water bath
- ☐ Start of opening approx. 87 °C
- ☐ Full opening approx. 102 °C
- ☐ Stroke min. 7 mm

### 4 - Cylinder head/cylinder block

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)

### 5 - Auxiliary heating

### 6 - Expansion reservoir

- ☐ with cap
- ☐ Testing the pressure relief valve in the cap  
⇒ [page 114](#)

### 7 - Intake manifold

### 8 - Exhaust gas recirculation radiator

- ☐ fill with fresh coolant after replacing
- ☐ removing and installing ⇒ [page 197](#)

### 9 - Radiator flap for exhaust gas recirculation

### 10 - Non-return valve

- ☐ integrated into the coolant hose
- ☐ not always visible from the outside

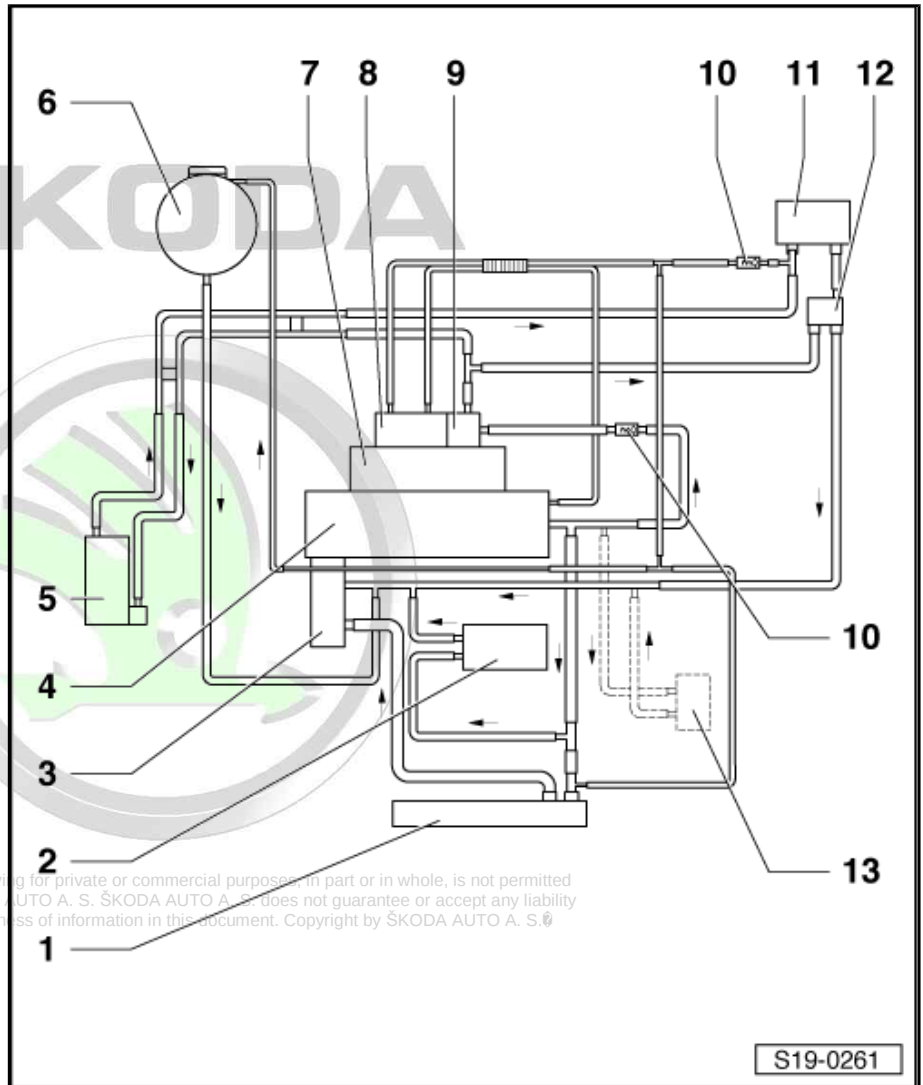
### 11 - Heat exchanger for heating

- ☐ fill with fresh coolant after replacing ⇒ [page 106](#)

### 12 - Coolant shut-off valve of heating system -N279-

### 13 - ATF radiator

- ☐ for models with an automatic gearbox
- ☐ fill with fresh coolant after replacing ⇒ [page 106](#)



### 1.3.3 Engine with engine identification characters BLS

#### 1 - Expansion reservoir

- ☐ with cap
- ☐ Testing the pressure relief valve in the cap  
⇒ [page 114](#)

#### 2 - Exhaust gas recirculation radiator

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)
- ☐ removing and installing  
⇒ [page 200](#)

#### 3 - Heat exchanger for heating

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)

#### 4 - ATF radiator

- ☐ for models with an automatic gearbox
- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)

#### 5 - Cylinder head/cylinder block

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)

#### 6 - Top coolant hose

#### 7 - Oil cooler

- ☐ fill with fresh coolant after replacing  
⇒ [page 106](#)
- ☐ removing and installing  
⇒ [page 89](#)

#### 8 - Radiator

- ☐ removing and installing ⇒ [page 112](#)
- ☐ fill with fresh coolant after replacing ⇒ [page 106](#)

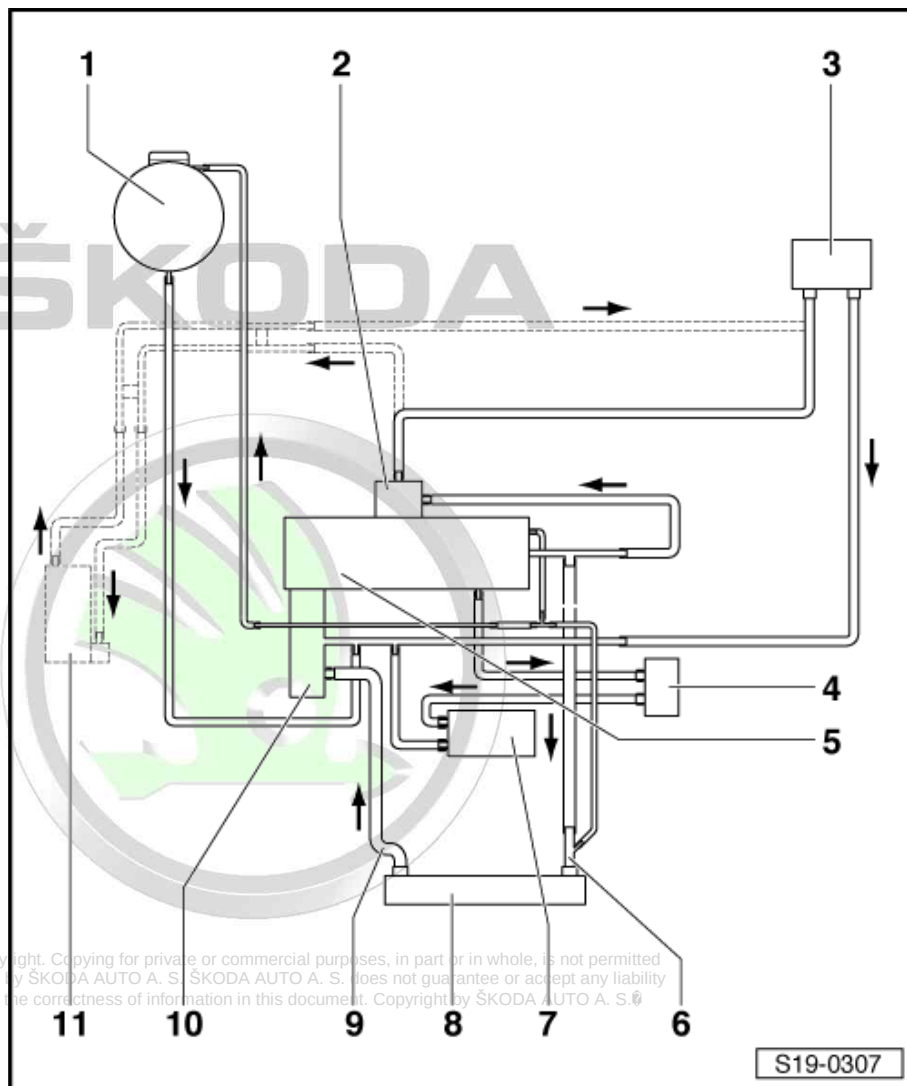
#### 9 - Bottom coolant hose

#### 10 - Coolant pump/coolant regulator

- ☐ removing and installing ⇒ [page 109](#)

#### 11 - Auxiliary heating

- ☐ only for vehicles with auxiliary heating.



## 1.4 Draining and filling up coolant

### Special tools and workshop equipment required

- ◆ Catch pan , e.g. - VAS 6208-
- ◆ Pliers for spring strap clamps
- ◆ Refractometer -T10007-

## Draining



### Note

*Collect drained coolant in a clean container for proper disposal or reuse.*



### WARNING

*Hot steam or hot coolant may escape when the compensation bottle is opened. Cover the cap with a cloth and open carefully.*

- Open the cap of the coolant expansion reservoir.
- Remove noise insulation ⇒ Body Work ⇒ Rep. Gr. 50 .
- Position drip tray (e.g. -VAS 6208 - ) under the engine.

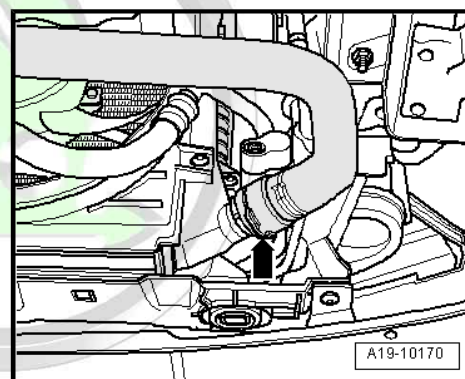
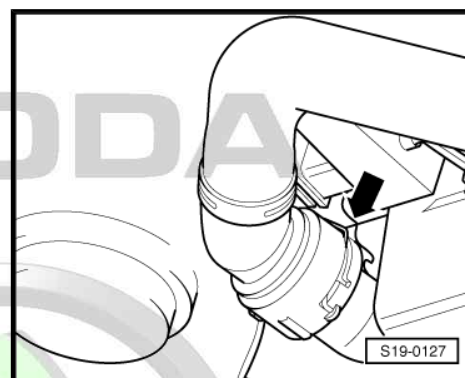
### For engine with engine identification characters BJB, BKC, BXE

- Remove the coolant hose from the radiator; to do so pull the retaining clip -arrow-.

### For engine with engine code BLS

- Remove the coolant hose from the radiator; to do so pull the retaining clip -arrow-.

### For all vehicles



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



- Also remove the coolant hose on the oil cooler -arrow- and drain residual coolant.

**Vehicles with auxiliary heating with engine identification characters BKC, BXE**

- Remove the coolant hoses on the pipes of the auxiliary heating and drain residual coolant.

**Filling up**



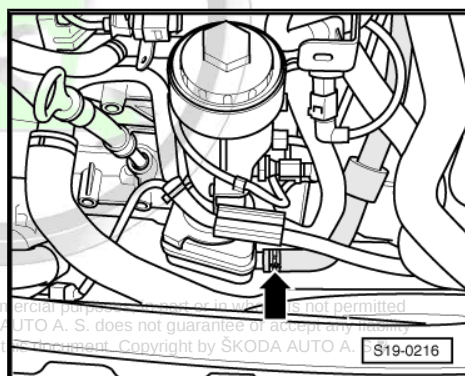
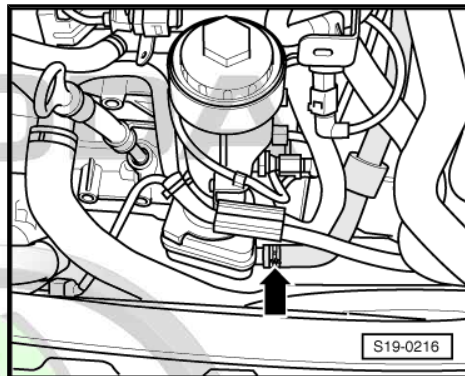
**Note**

*Replace O-rings.*

- Connect coolant hose at bottom of radiator.
- Fit coolant hose onto oil cooler -arrow-.

Select the appropriate coolant additive from the electronic catalogue of original parts Škoda or from the list of allowed coolant additives ⇒ Maintenance ; Octavia II .

- First of all prepare required quantity of coolant mixed to the correct ratio in a suitable vessel ⇒ Maintenance ; Octavia II .



Protected by copyright. Copying for private or commercial purposes without prior written permission is not permitted.  
unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability  
with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

- Top up coolant through the connection of the expansion reservoir, until the maximum marking of the coolant level is reached.
- Start engine, run for not more than 2 minutes at approx. 1500 rpm and while doing so top up coolant in the expansion reservoir.
- Tighten cap at expansion reservoir.
- Then run engine until radiator fan -V7 - starts.

#### Vehicles with auxiliary heating with engine identification characters BKC, BXE

- Place the coolant hoses onto the pipes of the auxiliary heating and secure with spring strap clamps.



#### Caution

*The auxiliary heating must only be switched on, if the refrigerant circuit is filled up -as described below-.*

- Connect vehicle diagnosis, measurement and information system -VAS 5051- .
- Start the engine and maintain the engine revolutions for about 3 minutes at about 2000 r.p.m.
- On the display press consecutively the buttons for “Vehicle self-diagnosis”, “18 - Auxiliary heating system” and “03 - Actuator diagnosis”.
- Press the right button on the display so often until the coolant shut-off valve of heating system -N279- is shown.
- Perform self-diagnosis of the coolant shut-off valve of heating system -N279- and maintain the engine speed at approx. 2000 rpm for about 1 minute.
- Run engine until fan starts.

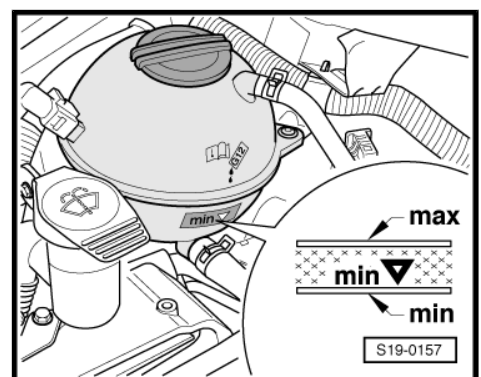
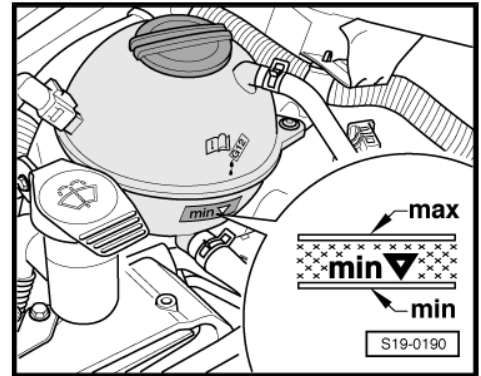
#### For all vehicles

- Check coolant level when the expansion reservoir is closed.
- When engine is at operating temperature the coolant level must be at the maximum marking, when engine is cold between the minimum and the maximum markings.



#### WARNING

*Hot steam may escape when the coolant compensation bottle is opened. Wear safety goggles and safety clothing, in order to avoid eye injuries and scalding. Cover the cap with a cloth and open carefully.*



- If necessary, top up with coolant.

## 1.5 Removing and installing coolant pump

### Removing

- Drain coolant ➔ [page 106](#) .
- Remove V-ribbed belt ➔ [page 21](#) .
- Remove tensioning device for V-ribbed belt at middle toothed belt guard ➔ [page 21](#)



- Take toothed belt off camshaft sprocket ➔ [page 24](#) .
- Unscrew fixing bolts -1- of the coolant pump and remove the coolant pump -2-.
- Remove O-ring -3-.

### Install

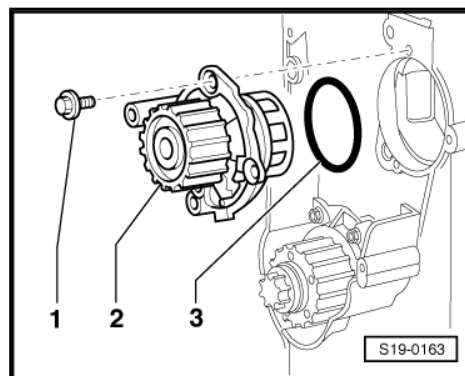
Installation is performed in the reverse order, pay attention to the following points:



### Note

*Replace O-ring.*

- Clean sealing surface for O-ring or smoothen.
- Moisten new O-ring -3- with coolant.
- Attach the coolant pump -2-.
- Fitting position: Plug in housing points down.
- Tighten screws -1- of coolant pump to 15 Nm.
- install (set the timing) ➔ [page 24](#) .
- Install the V-ribbed belt ➔ [page 21](#) .
- Top up coolant ➔ [page 108](#) .



## 1.6 Removing and installing coolant regulator

### Special tools and workshop equipment required

- ♦ Catch pan , e.g. - VAS 6208-
- ♦ Pliers for spring strap clamps

### Removing



### Note

*Collect drained coolant in a clean container for proper disposal or reuse.*



### WARNING

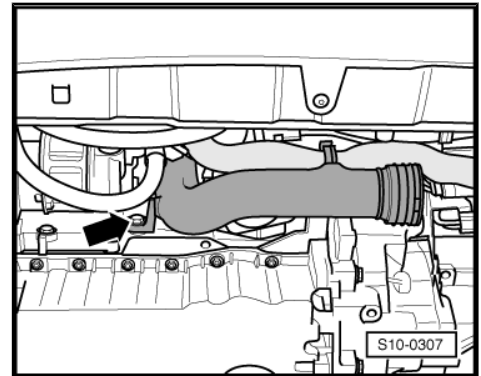
***Hot steam or hot coolant may escape when the compensation bottle is opened. Cover the cap with a cloth and open carefully.***

- Drain coolant ➔ [page 107](#) .

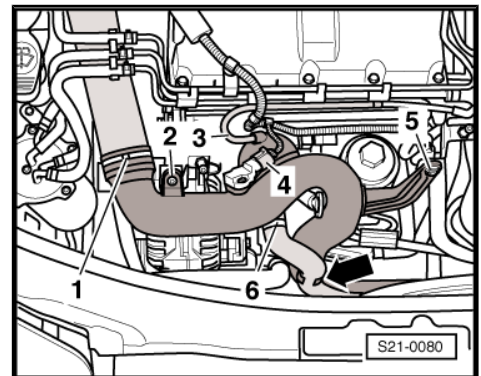
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

**For engine with engine identification characters BJB, BKC, BXE**

- Unscrew fixing screw -arrow- for front air guide pipe.



- Detach vacuum line -3- at vacuum reservoir.
- Disconnect plug connection -4- at the charge pressure sender -G31-.
- Detach coolant hose -6- from the connection and separate from air guide pipe -arrow-.
- Unscrew screws -2- and -5- and remove air guide pipe, to do so pull retaining clips -1-.



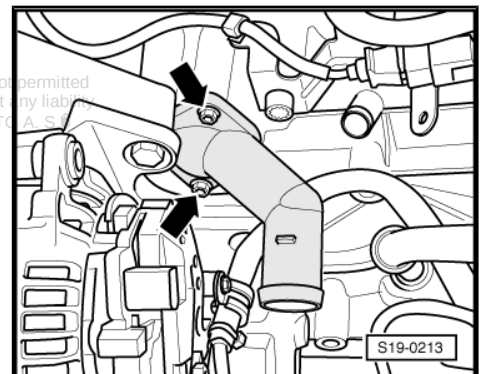
**For engine with engine code BLS**

- Detach coolant hose from the connection and separate from air guide pipe.

**For all vehicles**

- Screw out screws -arrows- and remove connection fittings.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.



- Turn coolant thermostat -2- approx. 90° (1/4 turn) anti-clockwise -arrow- and remove from connection fitting.
- Remove O-ring -1-.

**Install**

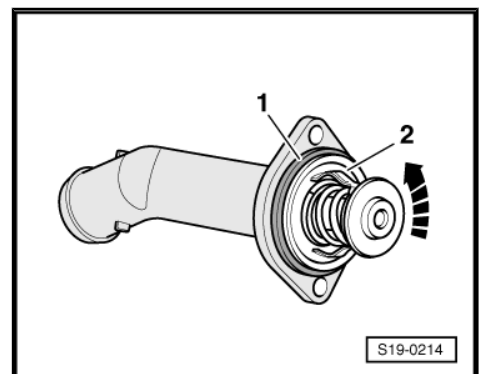
Installation is performed in the reverse order, pay attention to the following points:



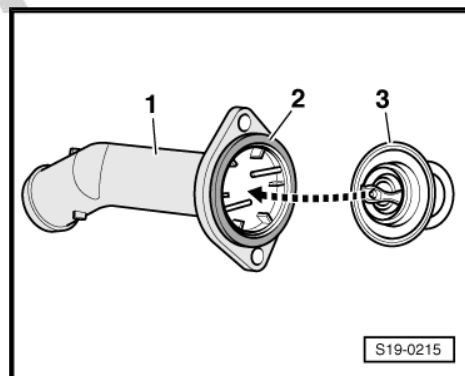
**Note**

*Replace O-ring.*

- Clean sealing surface for O-ring or smoothen.



- Fit coolant regulator -3- with new O-ring -2- in the connection fittings -1-.
- When inserting, the coolant regulator clamp must stand horizontally, as shown in the fig.
- Then turn the coolant regulator 90° (1/4 turn) clockwise.
- Moisten O-ring with coolant.
- Fit connection fitting onto cylinder block and tighten screws to 15 Nm.
- Top up coolant ⇒ [page 108](#) .



## 1.7 Removing and installing radiator

### Special tools and workshop equipment required

- ◆ Catch pan , e.g. - VAS 6208-
- ◆ Pliers for spring strap clamps

### Removing



#### Note

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

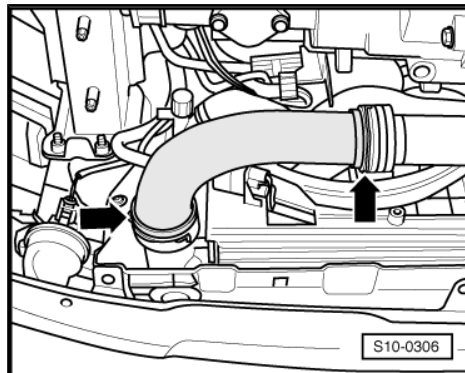
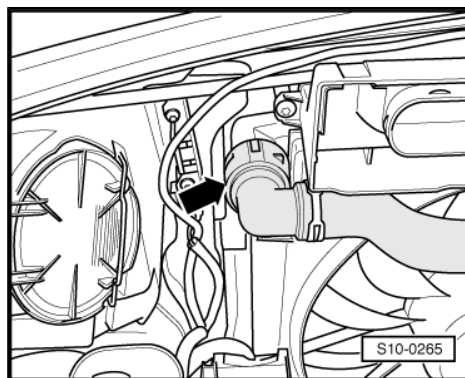
*Collect drained coolant in a clean container for proper disposal or reuse.*



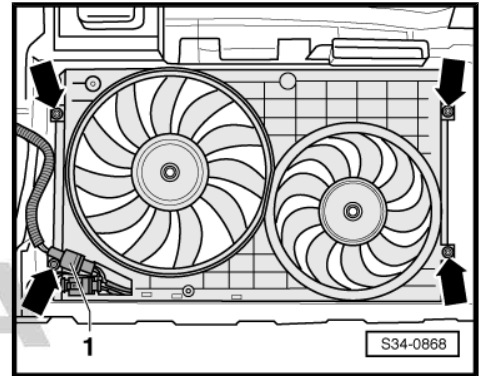
### WARNING

*Hot steam or hot coolant may escape when the compensation bottle is opened. Cover the cap with a cloth and open carefully.*

- Drain coolant ⇒ [page 107](#) .
- Remove coolant hose at top of radiator -arrow-.
- Remove intake air guide to air filter.
- Remove left charge air hose, to do so pull the retaining clips -arrows-.



- Disconnect plug connection -1-.
- Unscrew fixing bolts for fan shroud -arrows- and remove fan shroud downwards.



- Screw out screws -arrows- on the radiator reverse side.
- Raise the radiator and remove downwards.

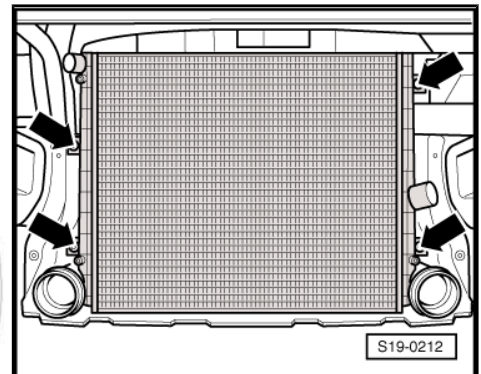
#### Install

Installation is performed in the reverse order, pay attention to the following points:



#### Note

- ◆ Replace gasket rings and O-rings.
- ◆ Secure all hose connections with corresponding hose clips.
- Top up coolant ➔ [page 108](#).

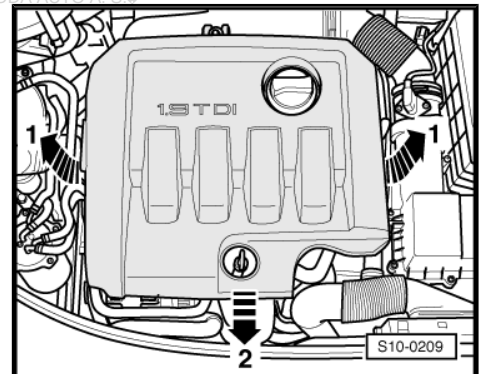


## 1.8 Removing and installing fan shroud for radiator fan -V7- and -V177-

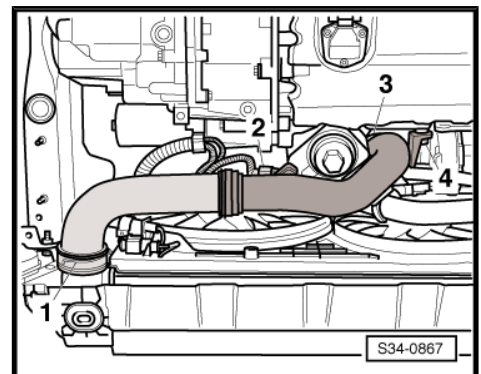
#### Removing

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ®

- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.
- Remove air filter with intake air hose from lock carrier ➔ [page 175](#).
- Remove noise insulation ➔ Body Work ➔ Rep. Gr. 50.



- Disconnect plug -2- from charge pressure sender - G31- / intake air temperature sender -G42-.
- Release screw -4-.
- Remove charge air pipe with connecting hose; to do so raise the retaining clips -1- and -3-.

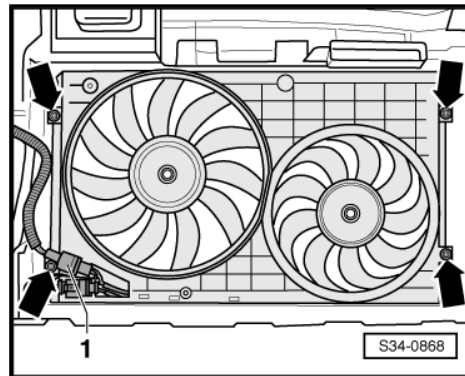


- Disconnect plug connection -1-.
- Screw out screws -arrows- and take out fan shroud downwards.

### Install

Installation is performed in the reverse order, pay attention to the following points:

- ♦ Tightening torques: ➔ [page 95](#) .



## 1.9 Checking the coolant system for tightness

### Special tools and workshop equipment required

- ♦ Coolant system tester , e.g. -V.A.G 1274-
- ♦ Adapter , e.g. -V.A.G 1274/8 -
- ♦ Adapter , e.g. -V.A.G 1274/9 -

### Test condition

- Engine must be warm.

### Test sequence



### WARNING

*Hot steam or hot coolant may escape when the compensation bottle is opened. Cover the cap with a cloth and open carefully.*

- Open the cap of the coolant expansion reservoir.
- Position coolant system tester e.g. -V.A.G 1274- with adapter e.g. -V.A.G 1274/8- on the compensation bottle.
- Generate an overpressure of approx. 1.0 bar for testing the cooling system.

If the pressure drops:

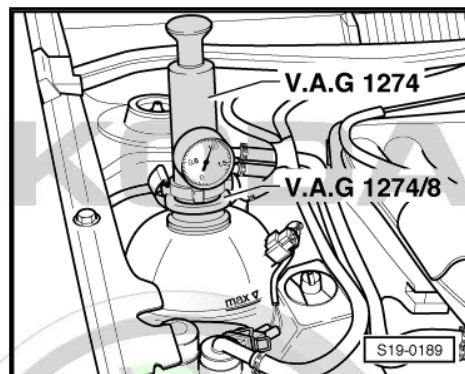
- Determine position of the leak and repair fault.

### Testing the pressure relief valve in the cap

- Position coolant system tester e.g. -V.A.G 1274- with adapter e.g. -V.A.G 1274/9- on the cap.
- Generate an overpressure for testing the pressure relief valve.
- The pressure relief valve should open at a pressure of 0.14 ... 0.16 MPa (1.4 ... 1.6 bar).

If the pressure relief valve does not open:

- Replace cap.







## 20 – Fuel Supply

### 1 Removing and installing parts of the fuel supply system



#### Note

- ◆ Fuel lines are secured with quick-release couplings.
- ◆ Fuel hoses must be secured only with spring strap clips. The use of clamp-type or screw-type clips is not allowed.
- ◆ Use pliers for spring strap clips to fit the spring strap clips.

Observe safety measures ⇒ [page 3](#) .

Observe rules for cleanliness ⇒ [page 4](#) .

#### 1.1 Fuel tank with attached parts

##### 1 - Mounting part

##### 2 - Fuel filler cap

- ☐ replace the O-ring if it is damaged

##### 3 - Earth connection

##### 4 - 11 Nm

##### 5 - Support

##### 6 - Fuel tank

- ☐ when removing support, for example with the engine/gearbox jack - V.A.G 1383 A -
- ☐ removing and installing ⇒ [page 122](#)

##### 7 - 25 Nm

##### 8 - Circlip

##### 9 - Tensioning strap

- ☐ Check fitting position

##### 10 - Heat shield

##### 11 - Fuel cooler

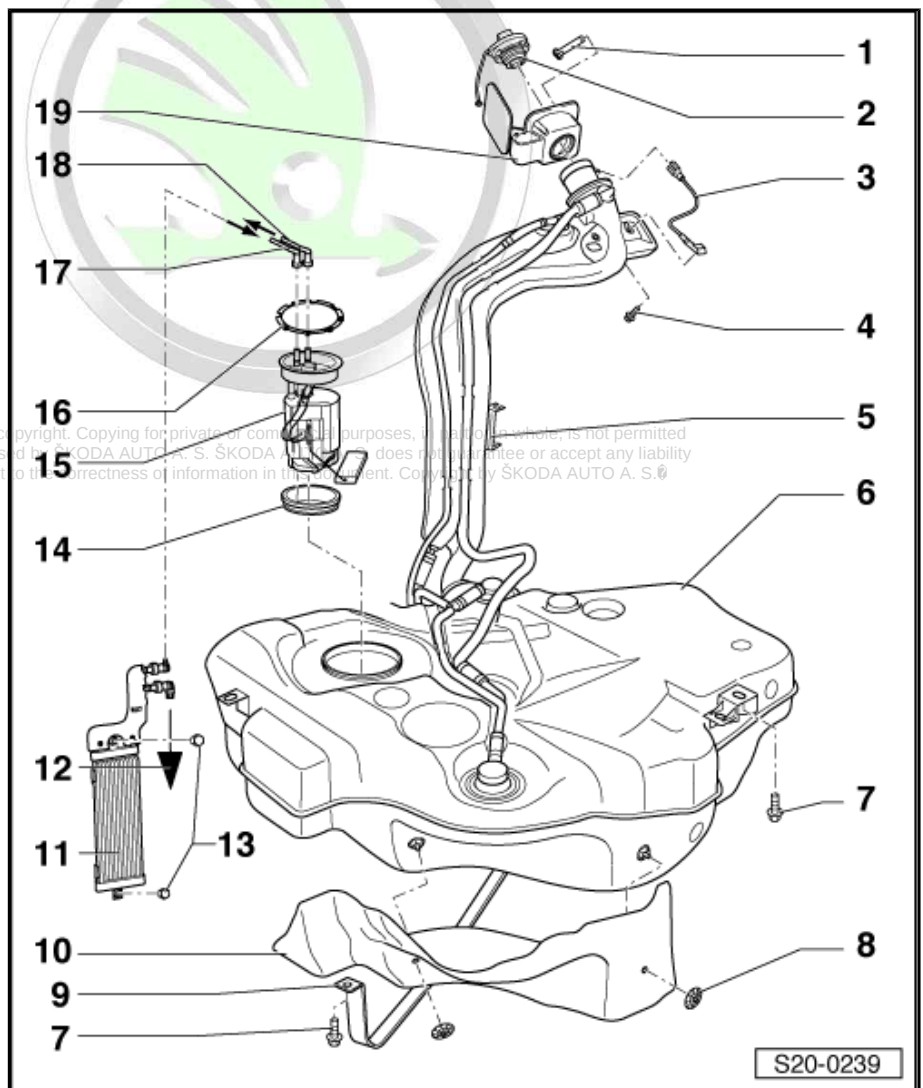
- ☐ removing and installing ⇒ [page 122](#)

##### 12 - to fuel filter

##### 13 - 20 Nm

##### 14 - Gasket ring

- ☐ to be inserted dry into the opening of the fuel



tank

- ☐ replace
- ☐ Moisten the fuel delivery unit with fuel only from inside when installing the flange.

#### 15 - Fuel delivery unit

- ☐ with sender for fuel gauge display - G-
- ☐ removing and installing ⇒ [page 126](#)
- ☐ note the installed position of the fuel tank ⇒ [page 116](#)
- ☐ Check the fuel delivery unit ⇒ [page 125](#) .
- ☐ Clean strainer if dirty
- ☐ removing and installing the sender for fuel gauge display ⇒ [page 133](#)

#### 16 - Lock ring, 110 Nm

- ☐ use wrench -T30101 (3087)- for removing and installing
- ☐ check for firm seating

#### 17 - Return-flow line

- ☐ from fuel cooler
- ☐ clipped in place on fuel tank
- ☐ check for firm seating
- ☐ blue

#### 18 - Feed line

- ☐ to fuel filter
- ☐ clipped in place on fuel tank
- ☐ check for firm seating
- ☐ black

#### 19 - Fuel tank lid unit

- ☐ with rubber bowl
- ☐ removing and installing ⇒ Body Work ⇒ Rep. Gr. 55

#### Fitting position of the flange of the fuel delivery unit/fuel gauge sender

Marking -3- on the flange points of the fuel delivery unit against the direction of travel.



#### Note

*The fuel delivery unit can only be installed in this position.*

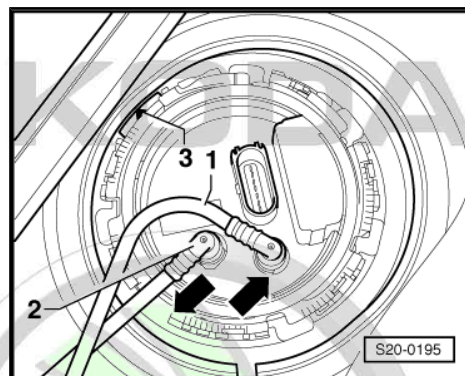
Blue or blue marked return-flow line -1-.

Black feed line -2-.



#### Note

*After installing the flange of the fuel delivery unit, check whether the feed and return-flow lines are still clipped in place on the fuel tank.*



## 1.2 Fuel tank with component parts - four-wheel drive vehicles

### 1 - Return-flow line

- ☐ from fuel cooler
- ☐ clipped in place on fuel tank
- ☐ check for firm seating
- ☐ blue (marked blue)

### 2 - Feed line

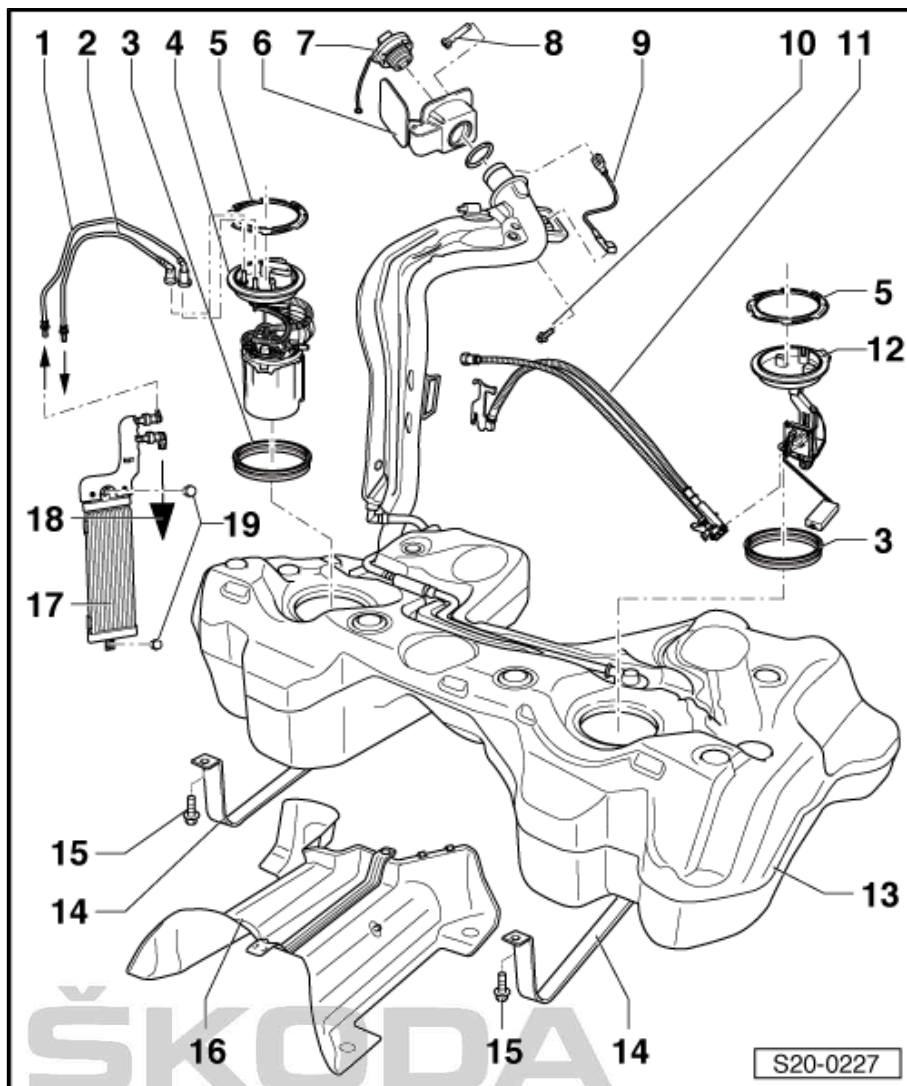
- ☐ to fuel filter
- ☐ clipped in place on fuel tank
- ☐ check for firm seating
- ☐ black

### 3 - Gasket ring

- ☐ to be inserted dry into the opening of the fuel tank
- ☐ replace if damaged
- ☐ only moisten from the inside the seal of the flange with fuel for installation purposes

### 4 - Fuel delivery unit

- ☐ with sender for fuel gauge display - G-
- ☐ removing and installing  
⇒ [page 128](#)
- ☐ note the installed position of the fuel tank  
⇒ [page 118](#)
- ☐ Check the fuel delivery





unit ⇒ [page 125](#) .

- ☐ Clean strainer if dirty
- ☐ Removing and installing the fuel gauge sender -G- ⇒ [page 133](#)

#### 5 - Lock ring, 110 Nm

- ☐ use wrench -T30101 (3087)- for removing and installing
- ☐ check for firm seating

#### 6 - Fuel tank lid unit

- ☐ with rubber bowl
- ☐ removing and installing ⇒ Body Work ⇒ Rep. Gr. 55

#### 7 - Fuel filler cap

#### 8 - Mounting part

#### 9 - Earth connection

- ☐ check for firm seating

#### 10 - 10 Nm

#### 11 - Suction spray pump

- ☐ connected to fuel gauge sender 2 -G169-
- ☐ removing and installing ⇒ [page 136](#)

#### 12 - Fuel gauge sender 2 -G169-

- ☐ note the installed position of the fuel tank ⇒ [page 118](#)
- ☐ removing and installing ⇒ [page 134](#)

#### 13 - Fuel tank

- ☐ when removing support, for example with the engine/gearbox jack -V.A.G 1383 A -
- ☐ removing and installing ⇒ [page 123](#)

#### 14 - Tensioning strap

- ☐ Check fitting position

#### 15 - 25 Nm

- ☐ replace

#### 16 - Heat shield

#### 17 - Fuel cooler

- ☐ removing and installing ⇒ [page 122](#)

#### 18 - to fuel filter

#### 19 - 20 Nm

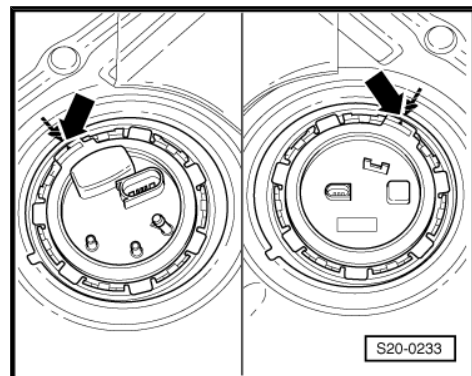
**Fitting position of the flange of the fuel delivery unit (with fuel gauge sender -G- ) and flange with fuel gauge sender 2 -G169-**

The markings on the flanges must be aligned with markings on the fuel tank -arrows-.



#### Note

*The markings on the fuel tank are hardly visible.*



## 1.3 Summary of components of fuel filter



### Note

Before disconnecting the fuel hoses, mark assignment to the supports.

### Fuel filter type one and two

#### 1 - Intake hose

- ☐ from fuel tank
- ☐ white or white marking

#### 2 - 8 Nm

#### 3 - Return-flow hose

- ☐ to fuel cooler
- ☐ blue or blue marking

#### 4 - Drain plug

- ☐ unscrew and drain (catch) approx. 0.1 litre fluid using the hand vacuum pump with adapter e. g. -V.A.G 1390- and ventilation reservoir - V.A.G 1390/1-

#### 5 - Gasket ring

- ☐ replace

#### 6 - Intake hose

- ☐ to the tandem pump
- ☐ white marking

#### 7 - Fuel filter - top part

#### 8 - Retaining clip

- ☐ replace if damaged

#### 9 - Fuel temperature sender - G81-

#### 10 - Return-flow hose

- ☐ from the tandem pump
- ☐ blue marking
- ☐ with connection fitting for fuel temperature sender -G81-

#### 11 - Fuel filter element

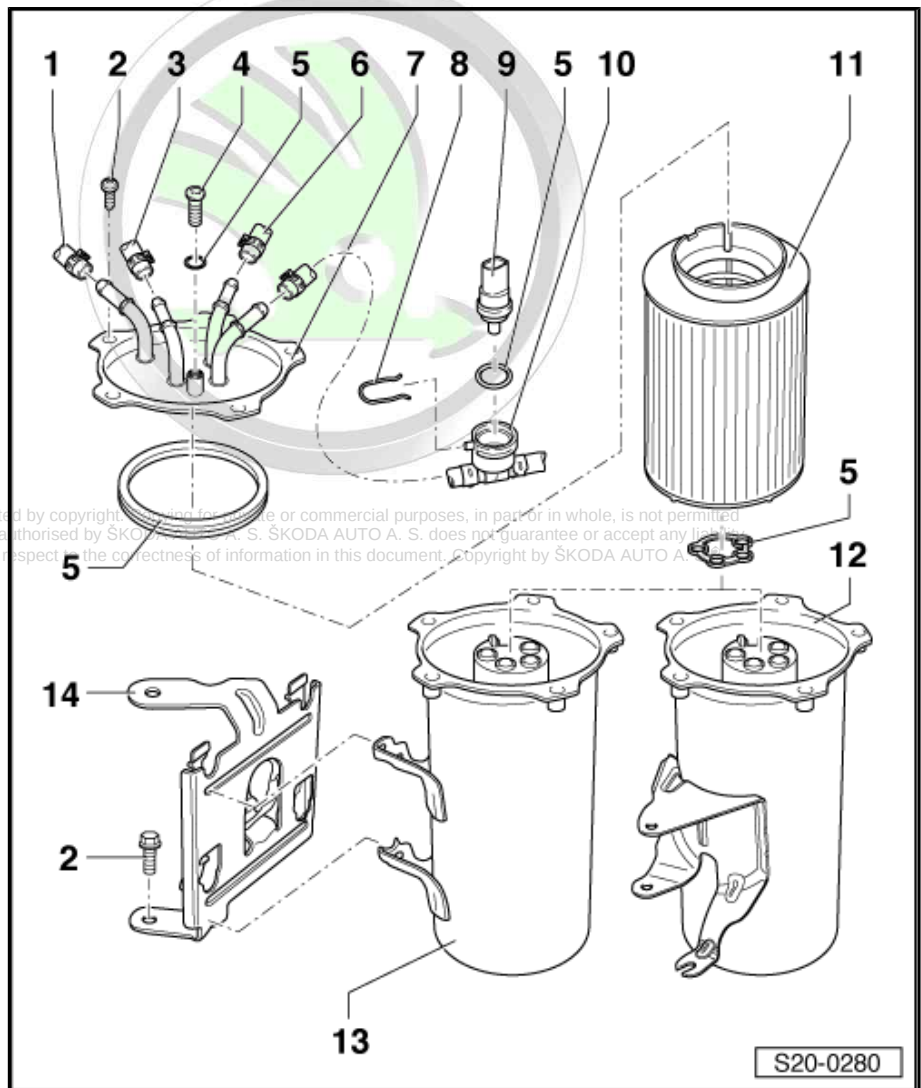
- ☐ pay attention to change intervals ⇒ Maintenance ; Octavia II.
- ☐ pay attention to Part No.

#### 12 - Fuel filter with integrated bracket - bottom part.

- ☐ mounted as of 08.05
- ☐ with integrated preheating valve

#### 13 - Fuel filter - bottom part

- ☐ mounted up to 08.05
- ☐ with integrated preheating valve



S20-0280



## 14 - Support

- ☐ mounted up to 08.05

### Fuel filter type three and four

#### 1 - Intake hose

- ☐ from fuel tank
- ☐ white marking

#### 2 - Return-flow hose

- ☐ to fuel cooler
- ☐ blue marking

#### 3 - Intake hose

- ☐ to the tandem pump
- ☐ white marking

#### 4 - Screw

- ☐ for type 3 (left part of the figure): 9 Nm
- ☐ for type 4 (right part of the figure): 5 Nm

#### 5 - Retaining clip

- ☐ replace if damaged

#### 6 - Fuel temperature sender - G81-

#### 7 - Gasket ring

- ☐ replace

#### 8 - Return-flow hose

- ☐ from the tandem pump
- ☐ blue marking
- ☐ with connection fitting for fuel temperature sender -G81-

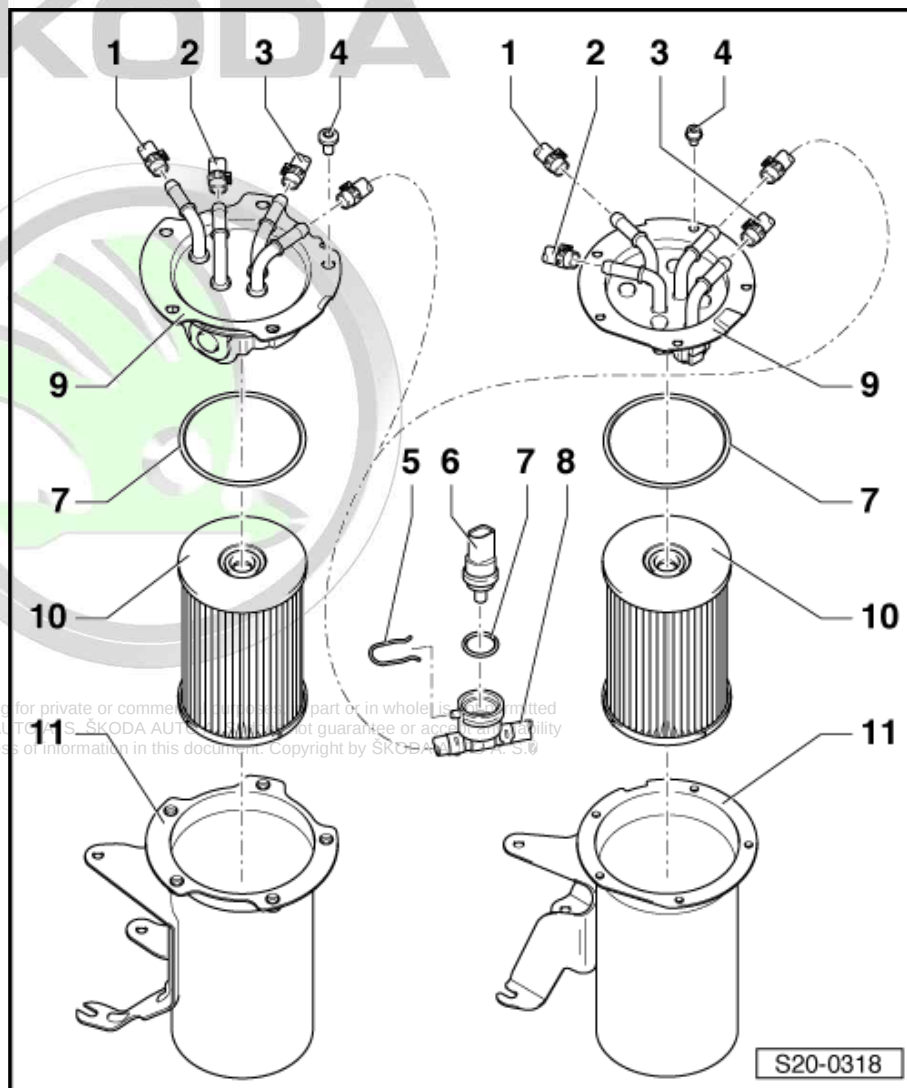
#### 9 - Fuel filter - top part

- ☐ with integrated preheating valve

#### 10 - Fuel filter element

- ☐ pay attention to change intervals ⇒ Maintenance ; Octavia II.
- ☐ pay attention to Part No.

#### 11 - Fuel filter with integrated bracket - bottom part.



## 1.4 Extract fuel from the fuel tank

### Special tools and workshop equipment required

- ◆ Hose adapter , e.g. -V.A.G 1318-16 -
- ◆ Adapter , e.g. -V.A.G 1318-17 -
- ◆ Auxiliary cable set , e.g. -V.A.G 1594 C-
- ◆ Battery
- ◆ Catch pan for fuel

**i Note**

*If the fault is at the fuel delivery unit, the fuel is suctioned with the fuel suction equipment e. g. -VAS 5190-*

**Procedure**

- Switch off all electrical components and withdraw key from ignition key housing.
- Removing rear seat bench ⇒ Body Work ⇒ Rep. Gr. 72 .
- Remove the trim panel of the fuel delivery unit.

**i Note**

*For vehicles with auxiliary heating, the plug connection for the dosing pump -V54- must also be separated.*



**WARNING**

***The fuel feed line is pressurized! Wear safety goggles and safety clothing, in order to avoid injuries and skin contact. Place cleaning cloths around the connection point before detaching cable connections. Reduce pressure by carefully removing the wiring.***

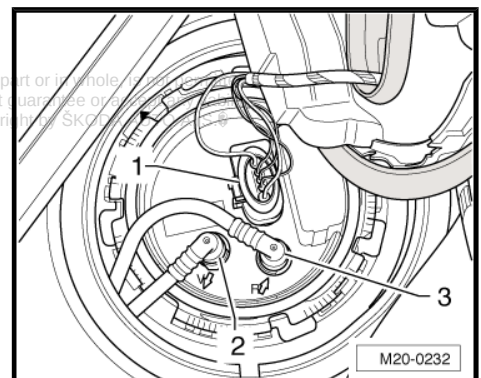
- Unplug the 5-pin connector -1- and the black feed line -2-.



**Note**

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is prohibited unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright © ŠKODA AUTO A. S.

*Press in the securing ring in order to unlock the lines.*



- Connect up adapter -V.A.G 1318/16- and -V.A.G 1318/17- and connect the "suction line" to the feed support of the fuel pump.
- Hold the "suction line" in a suitable catch pan.
- Using auxiliary cables -A- from the measuring tool set -V.A.G 1594/C- connect up the battery through contacts of the fuel pump as follows:

Battery positive (+) to contact -1- of the fuel pump

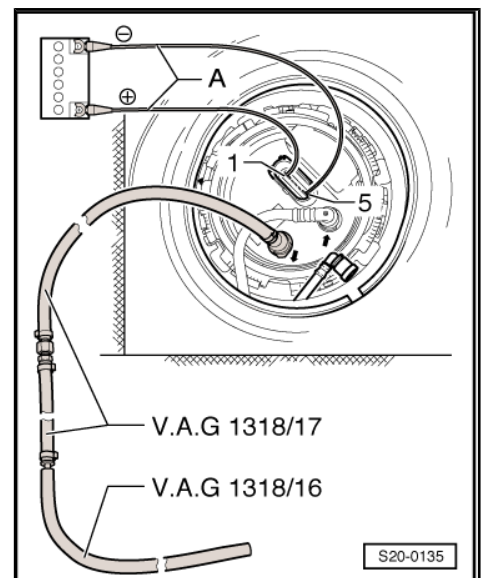
Battery minus (-) to contact -5- of the fuel pump

Fuel pump runs and suctions off fuel.



**WARNING**

***In order to avoid fuel overflow due to the fuel catch pan not being sufficiently large enough, the fuel pump must not run unattended.***



## 1.5 Removing and installing fuel cooler



### Note

*The fuel cooler is located at the return-flow line to the fuel tank. It is attached to the underfloor of the vehicle body.*

- Observe rules for cleanliness ⇒ [page 4](#).

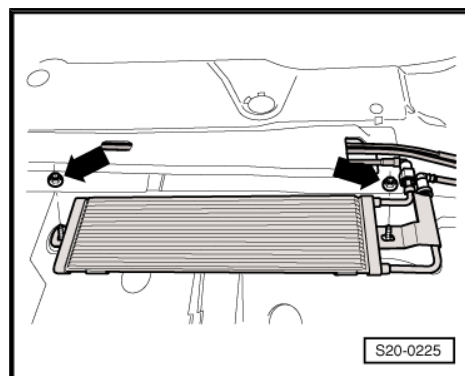
### Removing

- Removing the right underfloor trim panel.
- Separate fuel lines at fuel cooler.
- Unscrew fixing nuts for fuel cooler -arrows- and remove fuel cooler.

### Install

The installation occurs in reverse order:

Tighten fixing nuts for the fuel cooler to 18 Nm.



## 1.6 Removing and installing the fuel tank

### Special tools and workshop equipment required

- ♦ Engine/gearbox jack, e.g. -V.A.G 1383 A-

### Condition

- The fuel tank must be empty for weight reasons when removing it, if necessary suction the fuel out of the fuel tank ⇒ [page 120](#).

### Removing



### Note

- ♦ *Safety precautions when working on the fuel supply system* ⇒ [page 3](#).
- ♦ *Observe the regulations concerning cleanliness when working on the fuel supply/injection system* ⇒ [page 3](#).
- Switch off all electrical components and withdraw key from ignition key housing.
- Removing rear seat bench ⇒ Body Work ⇒ Rep. Gr. 72.

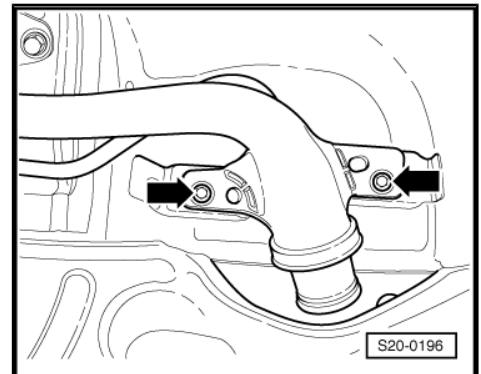


### Note

*For vehicles with auxiliary heating, the plug connection for the dosing pump -V54- must also be separated.*

- Remove the trim panel of the fuel delivery unit.
- Unlock connector and pull off from flange of the fuel delivery unit.

- Remove right rear wheel ⇒ Chassis ⇒ Rep. Gr. 44 .
- Remove the rear right wheelhouse liner ⇒ Body Work ⇒ Rep. Gr. 66 .
- Unscrew fixing bolts on filler neck -arrows-.
- Remove rear tunnel bridge ⇒ [page 185](#) .
- Slacken front clamping sleeve at exhaust sleeve and push clamping sleeve to the rear.
- Push out all suspensions of rear muffler from the retaining straps.
- Slightly lower the exhaust pipe and tie with wire to body.
- Disconnect the feed and return line on the front right of the fuel tank.



**i Note**

- ◆ *For vehicles with auxiliary heating, the fuel line of the dosing pump -V54- must also be separated.*
- ◆ *Press in the securing rings in order to unlock the connections of the fuel lines.*
- Unscrew tensioning strap and fixing screws. Support the fuel tank with engine/gearbox jack -V.A.G 1383 A- when removing.
- Lower the fuel tank.

**Install**

Installation is carried out in the reverse order. Pay attention to the following:

- ◆ Lay the vent and fuel hoses without any kinks.
- ◆ Do not mix-up the feed and return line (the return line is blue, the feed line is black).
- ◆ Make sure the fuel line connections fit tightly.
- ◆ Check feed, return and ventilation line at fuel tank for firm seating.
- ◆ Check earth connection of fuel tank/body at filler neck.

## 1.7 Removing and installing the fuel tank for four-wheel drive vehicles

### Special tools and workshop equipment required

- ◆ Engine/gearbox jack , e.g. -V.A.G 1383 A-

### Removing

**i Note**

*Observe the safety instructions before starting fitting work  
⇒ [page 3](#) .*

- Disconnect the battery-earth strap with the ignition off ⇒ Electrical System ⇒ Rep. Gr. 27 .
- Drain the fuel tank.
- Removing rear seat bench ⇒ Body Work ⇒ Rep. Gr. 72 .

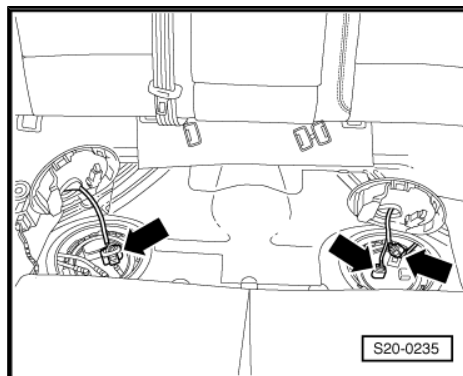
- Remove the cover of the fuel delivery unit and the cover from the fuel gauge sender 2 -G169- .



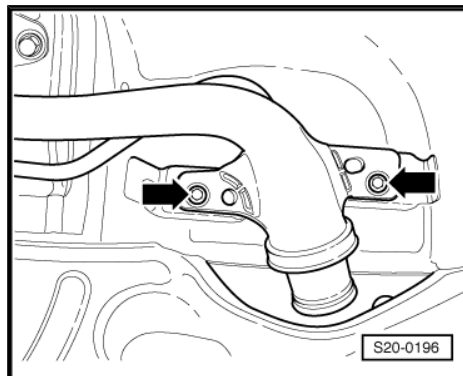
#### Note

*For vehicles with auxiliary heating, the plug connection for the dosing pump -V54- must also be separated.*

- Pull out the connector from the flange of the fuel delivery unit and from the flange of the fuel gauge sender 2 -G169- -arrows-.
- Remove right rear wheel ⇒ Chassis ⇒ Rep. Gr. 44 .
- Remove the rear right wheelhouse liner ⇒ Body Work ⇒ Rep. Gr. 66 .



- Unscrew fixing bolts on filler neck -arrows-.
- Remove rear exhaust pipe ⇒ [page 185](#) .
- Remove propshaft ⇒ Gearbox ⇒ Rep. Gr. 39 .

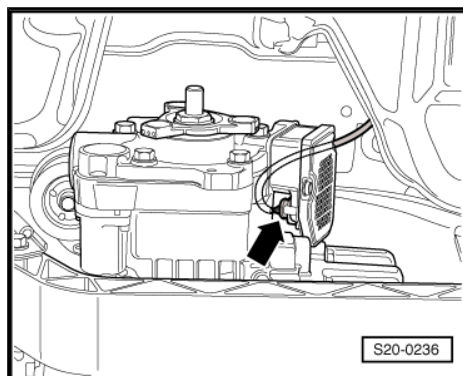


- Unplug connector from four-wheel drive control unit -J492- -arrow-.
- Disconnect the feed and return line on the front right of the fuel tank.



#### Note

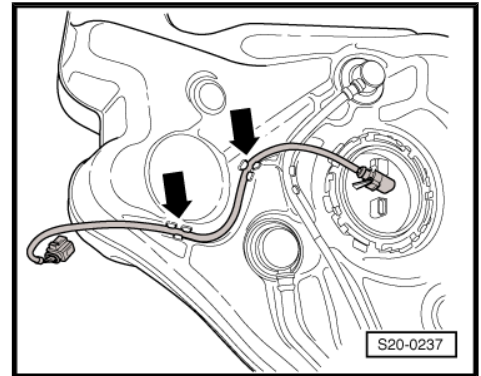
- ♦ *For vehicles with auxiliary heating, the fuel line of the dosing pump -V54- must also be separated.*
- ♦ *Press in the securing rings in order to unlock the connections of the fuel lines.*
- Unscrew the straps and fixing screws. Support the fuel tank with engine/gearbox jack -V.A.G 1383 A- when removing.
- Lower the fuel tank.



#### Install



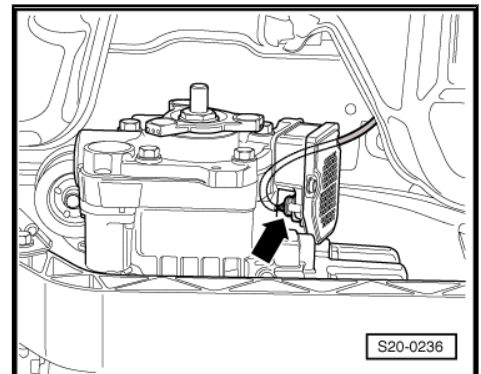
- Clip on cable from four-wheel drive control unit -J492- at the fuel tank -arrows-.
- Support the fuel tank using the engine/gearbox jack e.g. - V.A.G 1383 A - .
- Raise fuel tank in its installation position and install.



- Fit connector onto four-wheel drive control unit -J492- -arrow-.

Further installation occurs in reverse order to removal. Pay attention to the following:

- ◆ Lay the vent and fuel hoses without any kinks.
- ◆ Do not mix-up the feed and return line (the return line is blue, the feed line is black).
- ◆ Make sure the fuel line connections fit tightly.
- ◆ Check feed, return and ventilation line at fuel tank for firm seating.
- ◆ Check earth connection of fuel tank/body at filler neck.



## 1.8 Check the fuel delivery unit

### Special tools and workshop equipment required

- ◆ Remote control , e.g. -V.A.G 1348/3A-
- ◆ Measuring tool set , e.g. -V.A.G 1594 C-
- ◆ Adapter , e.g. -V.A.G 1318/16 -
- ◆ Adapter , e.g. -V.A.G 1318/17 -
- ◆ Measuring vessel

### Checking the function and supply voltage

#### Test conditions

- Battery voltage at least 11.5 V.
- Fuses o.k. (No. 27).
- All electrical components such as lights and rear window heater must be switched off.

#### Test sequence

- Removing rear seat bench ⇒ Body Work ⇒ Rep. Gr. 72 .
- Remove the trim panel of the fuel delivery unit.
- Switch on ignition. The fuel pump must be heard to start running.
- Switch off ignition.

If the fuel pump does not run:

- Continuing searching for faults using a multimeter (e.g. - V.A.G 1715- ) ⇒ Current flow diagrams and Fitting locations.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## Check fuel flow rate

### Test conditions

- Supply voltage o.k.
- Battery voltage at least 11.5 V.
- Fuel temperature 15...30°C.
- Fuel tank at least  $\frac{1}{4}$  full.

### Test sequence

- Release fuel filler cap from fuel filler neck.
- Removing rear seat bench ⇒ Body Work ⇒ Rep. Gr. 72 .
- Remove the trim panel of the fuel delivery unit.
- Unplug 5-pin connector from fuel delivery unit.
- Connect remote control -V.A.G 1348/3A- with connection lines from measuring tool set to contact -1- of the fuel delivery unit and to battery positive terminal.
- Use connection lines from the measuring tool set to connect the contacts -5- to the plug and to the fuel pump.



### WARNING

*The fuel feed line is pressurized! Place a clean cleaning cloth around the connection point before detaching hose connections. Reduce pressure by carefully releasing the connection point.*

- Connect adapter -V.A.G 1318/17- and -V.A.G 1318/16- to the fuel delivery unit and hold in the measuring vessel.
- Activate remote control -V.A.G 1348/3A- for 30 seconds.

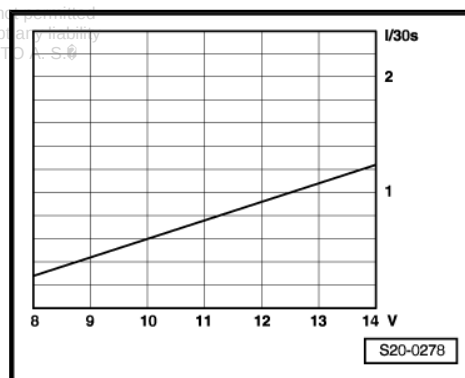
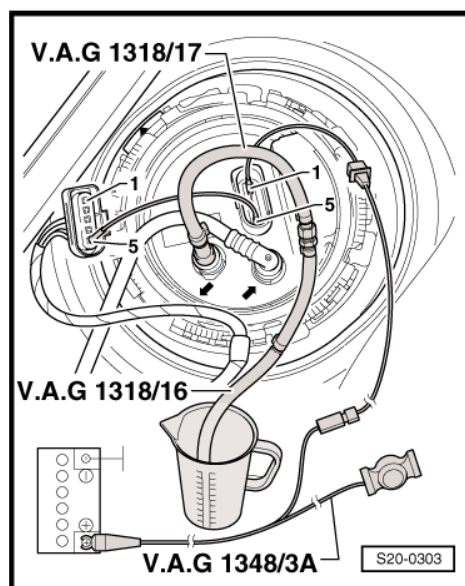
- Compare the amount of the fuel pumped to the specified value (the amount of the fuel pumped is dependent on the voltage of the fuel delivery unit).

If the minimum flow rate is not reached:

- Remove the fuel delivery unit and check whether the pump strainer is not clogged up.

If no fault was detected until now:

- Replace the fuel delivery unit.



## 1.9 Remove and install the fuel delivery unit for vehicles with front-wheel drive

### Special tools and workshop equipment required

- ◆ Key -T30101 (3087) - .

### Condition

- The fuel tank must not be more than  $\frac{3}{4}$  full.

## Removing

### Note

- ◆ Drain the fuel tank ➔ [page 120](#).
- ◆ Safety precautions when working on the fuel supply system ➔ [page 3](#).
- ◆ Observe the regulations concerning cleanliness when working on the fuel supply/injection system ➔ [page 3](#).
- Switch off ignition and withdraw ignition key.
- Removing rear seat bench ➔ Body Work ➔ Rep. Gr. 72.
- Remove the trim panel of the fuel delivery unit.

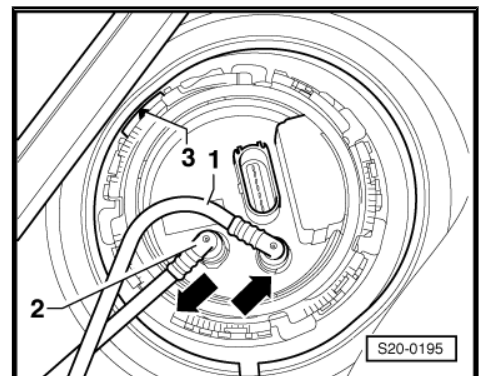
### Note

For vehicles with auxiliary heating, the plug connection for the dosing pump -V54- must also be disconnected.

- Disconnect the plug connector as well as the black feed line -2- and the blue return line -1- from the flange.

### Note

- ◆ Press in the securing ring in order to unlock the line.
- ◆ For vehicles with auxiliary heating the suction line for the dosing pump - V54- must be pulled out additionally (open lower clamp).

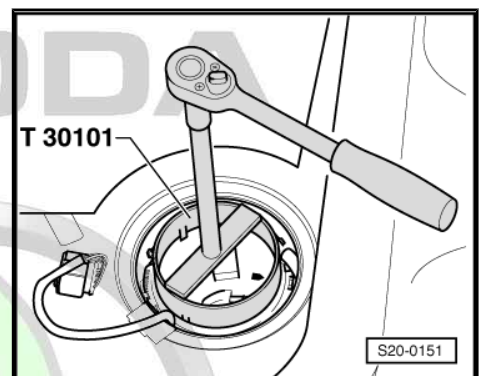


- Open lock ring with the wrench -T30101 -.

### Note

When removing the fuel delivery unit, ensure that the float arm of the sender for the fuel gauge display -G- is not bent.

- Pull the fuel delivery unit and the gasket ring out of the opening of the fuel tank.



### Note

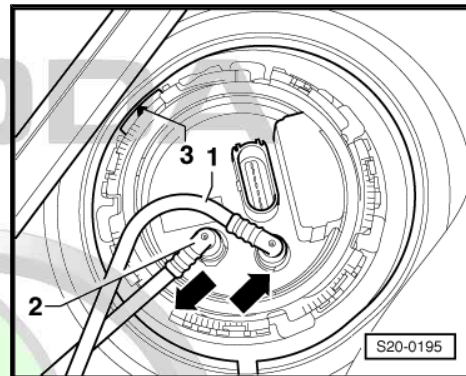
You must empty the old fuel delivery unit before disposing of it if you wish to replace it.

## Install

Installation of the fuel delivery unit occurs in reverse order. Pay attention to the following:

**Note**

- ◆ Insert new dry gasket ring into the opening of the fuel tank.
- ◆ The gasket must only be moistened from inside with fuel before assembly of the fuel delivery unit.
- ◆ Do not bend the sender for fuel gauge display when installing it.
- ◆ Fitting position of the fuel delivery unit: Marking on the flange -3- must point against the direction of travel. The fuel delivery unit can only be installed in this position.
- ◆ Do not interchange the feed and return lines.
- ◆ Tighten the lock ring to 110 Nm.
- ◆ Make sure the fuel lines fit tightly.
- ◆ After installing the fuel delivery unit, check whether the feed and return-flow lines are clipped in place on the fuel tank.



## 1.10 Removing and installing the fuel delivery unit on four-wheel drive vehicles

### Special tools and workshop equipment required

- ◆ Key -T30101 (3087) - .
- ◆ Protective gloves

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

### Condition

- The fuel tank must not be more than  $\frac{1}{3}$  full.

### Removing

**Note**

- ◆ Drain the fuel tank ⇒ [page 120](#) .
- ◆ Safety precautions when working on the fuel supply system ⇒ [page 3](#) .
- ◆ Observe the regulations concerning cleanliness when working on the fuel supply/injection system ⇒ [page 3](#) .
- Switch off ignition and withdraw ignition key.
- Removing rear seat bench ⇒ Body Work ⇒ Rep. Gr. 72 .
- Remove the trim panel of the fuel delivery unit.

**Note**

- ◆ For vehicles with auxiliary heating, the plug connection for the dosing pump -V54- must also be disconnected.
- ◆ Two types of fuel delivery units are installed in the vehicles. They can be recognised on the different flanges.



### Fuel delivery unit type one

- Disconnect the plug connector as well as the black feed line -1- and the blue return line -2- from the flange.

#### Note

- ◆ Press in the securing ring in order to unlock the line.
- ◆ For vehicles with auxiliary heating the suction line for the dosing pump - V54- must be pulled out additionally (open lower clamp).

- Open lock ring with the wrench -T30101 - .
- Pull out closing flange and gasket ring of the fuel delivery unit from the opening of the fuel tank and place to the side with the connected lines.

- Separate through the opening of the fuel tank the fuel line -1- to the suction jet pump, to do so press the release button.
- Unhook the fuel delivery line -2- at the fuel delivery unit, to do so pull the fixing clamp upwards -arrow-.

#### Note

- ◆ You must wear protective gloves for removing the fuel delivery unit.
- ◆ Take the fuel delivery unit out of the fuel tank in such a way that the electrical cables and the fuel hoses are not damaged and that the float arm of the sender for the fuel gauge display -G- is not bent.
- ◆ You must empty the old fuel delivery unit before disposing of it if you wish to replace it.

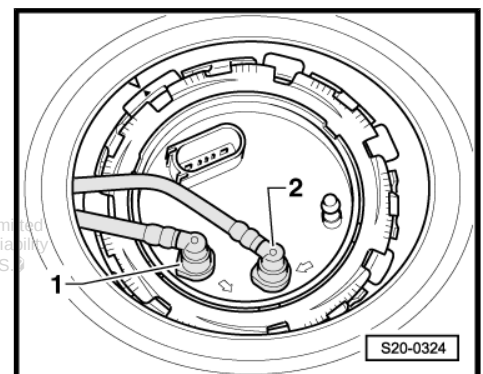
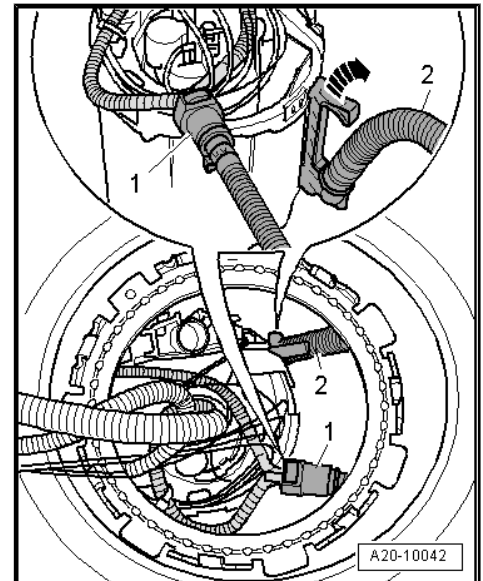
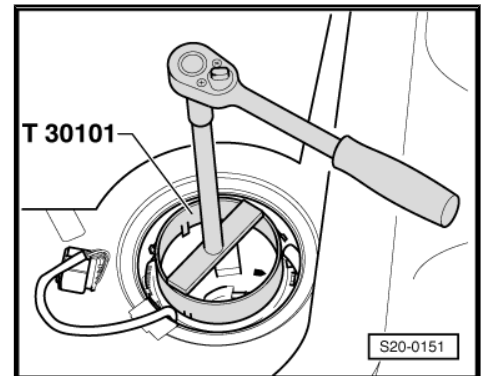
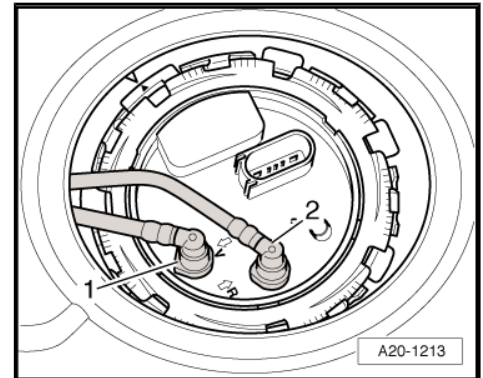
- Pull the fuel delivery unit out of the opening of the fuel tank.

### Fuel delivery unit type two

- Disconnect the plug connector as well as the black feed line -1- and the blue return line -2- from the flange.

#### Note

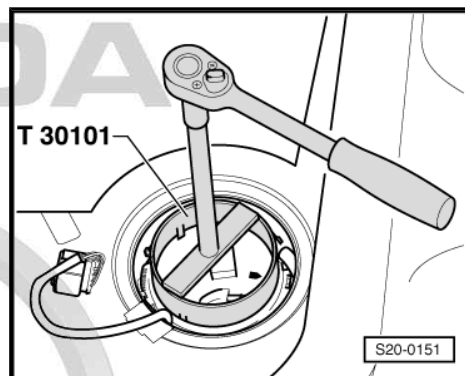
- ◆ Press in the securing ring in order to unlock the line.
- ◆ For vehicles with auxiliary heating the suction line for the dosing pump - V54- must be pulled out additionally (open lower clamp).







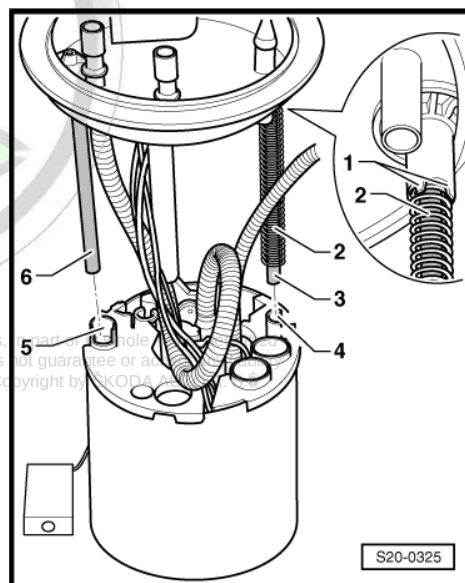
- Open lock ring with the wrench -T30101 -.



- Raise the closing flange and check if the spring -2- is still fastened on the flange -1-.

If the spring -2- is loose on the guide pipe -3-, hold it with your fingers while removing the closing flange.

- Pull out closing flange and gasket ring of the fuel delivery unit from the opening of the fuel tank and place to the side with the connected lines.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is prohibited unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

- Separate through the opening of the fuel tank the fuel line -1- to the suction jet pump, to do so press the release button.
- Separate the fuel delivery line -2- from the fuel delivery unit.

**i Note**

- ◆ *You must wear protective gloves for removing the fuel delivery unit.*
- ◆ *Take the fuel delivery unit out of the fuel tank in such a way that the electrical cables and the fuel hoses are not damaged and that the float arm of the sender for the fuel gauge display -G- is not bent.*
- ◆ *You must empty the old fuel delivery unit before disposing of it if you wish to replace it.*

- Pull the fuel delivery unit out of the opening of the fuel tank.

**Install**

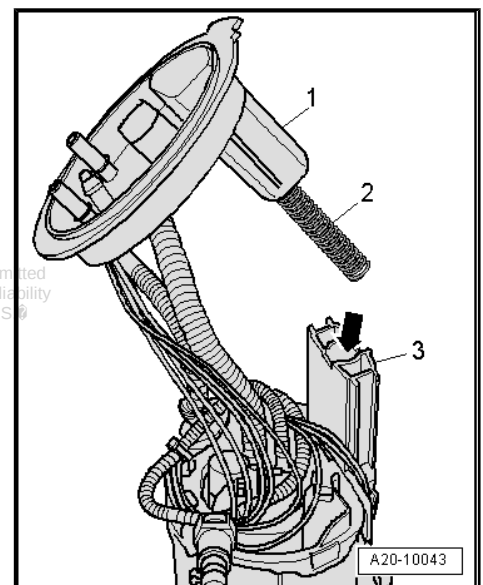
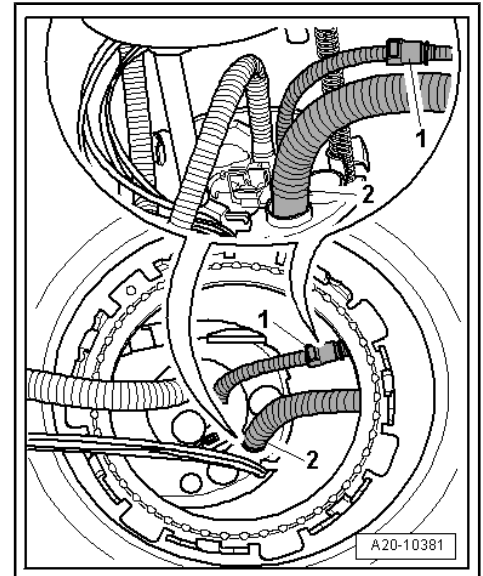
Installation of the fuel delivery unit occurs in reverse order. Pay attention to the following:

- Insert the fuel delivery unit into the fuel tank with the closing flange placed to the side. Thus, do not bend the float arm of the sender for the fuel gauge display -G- .
- Install the fuel delivery unit and the fuel line.
- Insert the new dry gasket ring of the flange into the opening of the fuel tank and moisten only from the inside with fuel for installing the closing flange.

**Fuel delivery unit type one**

- Slide the spring -2- into the opening of the guide -arrow- and fit the cable -1- of the closing flange on the cable -3- of the fuel delivery unit.

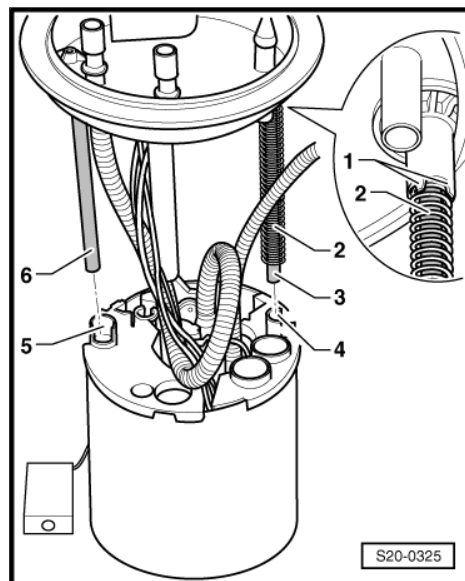
**Fuel delivery unit type two**



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.



- The spring -2- must be fastened to the retaining lugs -1- of the closing flange.
- First of all insert the guide pipe -3- into the opening of the guide -4-.
- Lower the closing flange in such a way that the guide pipe -6- grips into the opening of the guide -5-.

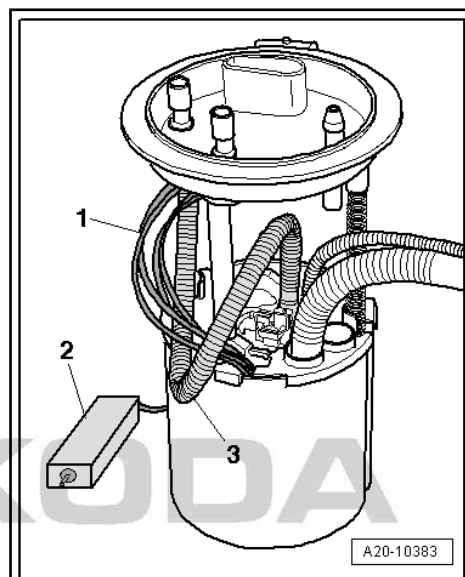
**Note**

*Pay attention that the electrical cables -1- and the fuel feed line -3- are routed according to the illustration and the float arm -2- is not blocked.*

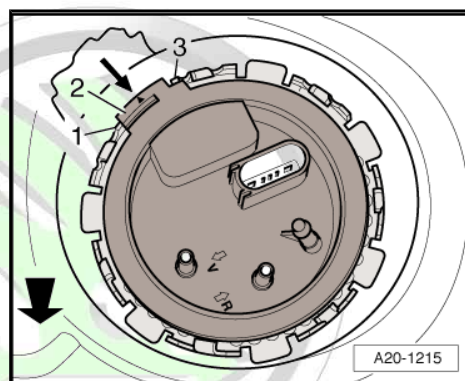
**Continued for the fuel delivery unit type one and two**

- Press the closing flange downwards and bring it into the installation position.

Further information:



- ◆ Fitting position of the fuel delivery unit: The peg -2- at the closing flange must be located between the pegs -1- and -3-. The -thick arrow- points in the direction of travel.
- ◆ Tighten the lock ring to 110 Nm.
- ◆ Do not interchange the feed and return lines.
- ◆ Make sure the fuel lines fit tightly.
- ◆ After installing the fuel delivery unit, check whether the feed and return-flow line are still clipped in place on the fuel tank.



## 1.11 Removing and installing the fuel gauge sender -G-

### Note

*There are two types of senders for the fuel gauge display -G- installed in the vehicles.*

#### Fuel gauge sender -G- type one

##### Removing

- Remove fuel delivery unit.
- ◆ Vehicles with front-wheel-drive: ➔ [page 126](#)
- ◆ Four-wheel drive vehicles: ➔ [page 128](#)
- Unlatch and disconnect the plug connection of the lines -1- (brown), -2- (blue) and -3- (black).
- Raise catches -4- and -5- with a screwdriver and remove the sender for fuel gauge display -G- from the bottom -arrow-.

##### Install

- Insert the fuel gauge sender -G- in the fuel delivery unit guides and press upwards until they latch into position.
- Connect the wiring and check correct installation of the plug.
- Install the fuel delivery unit.
- ◆ Vehicles with front-wheel-drive: ➔ [page 126](#)
- ◆ Four-wheel drive vehicles: ➔ [page 128](#)

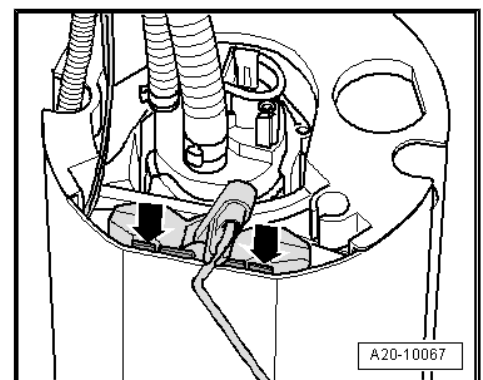
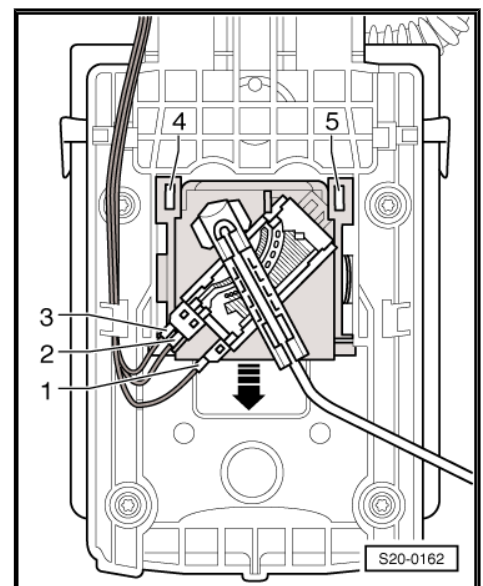
#### Sender for the fuel gauge display -G- type two

##### Removing

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted without the written permission of ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

- Remove fuel delivery unit.
- ◆ Vehicles with front-wheel-drive: ➔ [page 126](#)
- ◆ Four-wheel drive vehicles: ➔ [page 128](#)

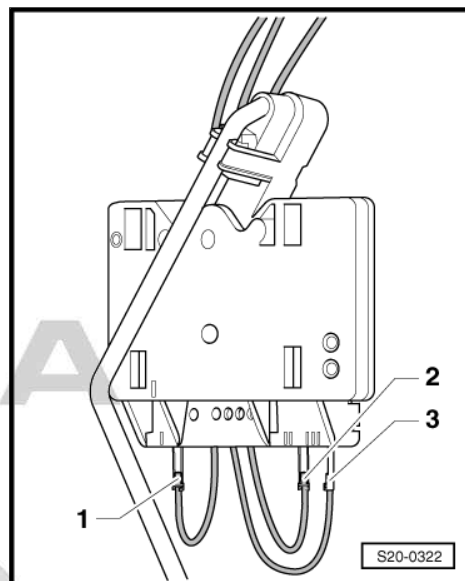
- Unlock the catches -arrows- using a screwdriver and pull out the sender for the fuel gauge display -G- towards the top.



- Unlatch and disconnect the plug connection of the lines -1- (brown), -2- (blue) and -3- (black).

#### Install

- Connect the wiring and check correct installation of the plug.
- Insert the sender for the fuel gauge display -G- in the guides at the fuel delivery unit and press downwards until they latch into position.
- Install the fuel delivery unit.
- ♦ Vehicles with front-wheel-drive: ➔ [page 126](#)
- ♦ Four-wheel drive vehicles: ➔ [page 128](#)



### 1.12 Removing and installing fuel gauge sender 2 -G169- for four-wheel drive vehicles

- The fuel tank must not be more than  $\frac{1}{2}$  full.

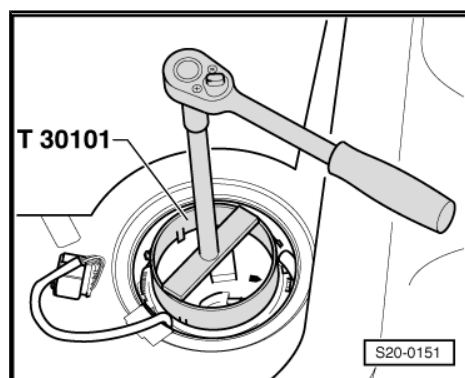


#### Note

- ♦ Empty the fuel tank if necessary ➔ [page 120](#) .
- ♦ Observe the safety instructions before starting fitting work ➔ [page 3](#) .
- ♦ Observe rules for cleanliness ➔ [page 4](#) .
- ♦ Make sure that the float arm of the sender is not bent.

#### Removing

- Disconnect the battery-earth strap with the ignition off ➔ Electrical System ➔ Rep. Gr. 27 .
- Removing rear seat bench ➔ Body Work ➔ Rep. Gr. 72 .
- Remove left cover and unplug connector from fuel gauge sender 2 -G169- .
- Unlock lock ring with wrench -T30101 (3087)- .





- Slightly pull fuel gauge sender 2 -G169- out of the opening of the fuel tank, release catches -arrows- and disconnect suction jet pump.

#### Install

- Installation is carried out in the reverse order. Pay attention to the following:



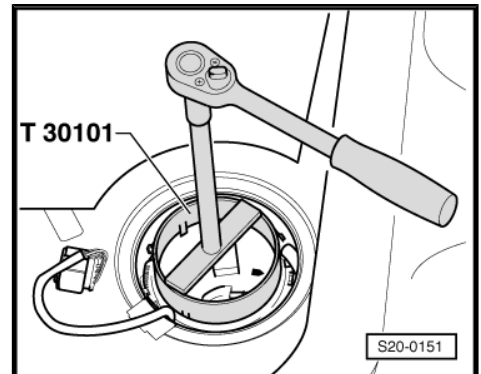
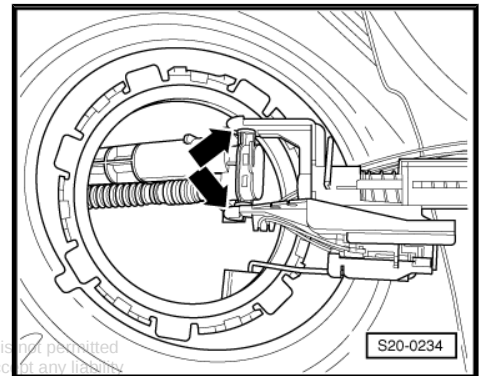
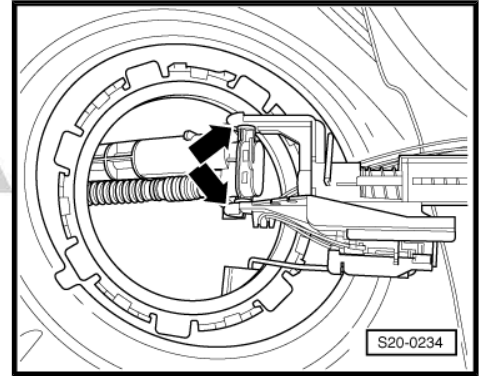
#### WARNING

*When installing do not bend the float arm of the fuel gauge sender 2 -G169-.*

- Insert the fuel gauge sender 2 -G169- into the fuel tank.
- Fit suction jet pump in fuel tank onto fuel gauge sender 2 -G169- and push in until the catches -arrows- latch into position.
- Insert the new dry gasket ring of the flange into the opening of the fuel tank and only moisten the inside (towards flange) with fuel.
- Check the installed position ⇒ [page 118](#) and insert flange of the fuel gauge sender 2 -G169- into the opening of the fuel tank.
- Check correct seating of the gasket ring.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

- Tighten the lock ring with wrench -T30101 (3087)- to 110 Nm.
- Fit on connector and install left cover.
- Undertake the work operation "Procedure after interrupting the power supply" ⇒ Vehicle diagnosis, testing and information system VAS 5051.

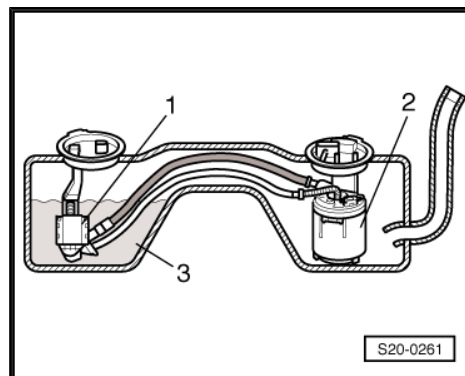


## 1.13 Removing and installing the suction jet pump for four-wheel drive vehicles



### Note

- ◆ The fuel tank for four-wheel drive vehicles consists of a left and right chamber. In order to pump the fuel out of the left chamber -3- of the fuel tank into the right chamber to the housing of the delivery unit -2-, a suction jet pump -1- is required.
- ◆ The version of the fuel tank for four-wheel drive vehicles requires that the fuel is pumped from the area of the fuel gauge sender 2 -G169- with a suction jet pump to the fuel delivery unit.
- ◆ A check is only to be carried out, if the engine stops because of fuel shortage, although the fuel gauge still indicates a fuel tank which is  $\frac{1}{4}$  full.



### Procedure

- Removing fuel delivery unit ➔ [page 128](#) .
- Remove fuel gauge sender 2 -G169- for four-wheel drive vehicles ➔ [page 134](#) .
- Now the suction jet pump can be pulled out from the side of the fuel gauge sender 2 -G169- (left vehicle side).
- Check, if the fuel lines on the suction jet pump are placed on firmly and not damaged.
- Check the suction jet pump additionally for possible contamination.

## 1.14 Removing and installing the tandem pump



### WARNING

**The tandem pump must not be disassembled, otherwise the proper operation of the pump vacuum part is no longer assured. This will result in a failure of the brake booster.**



### Caution

**Observe instructions for re-installing a used tandem pump ➔ [page 139](#) .**

### Special tools and workshop equipment required

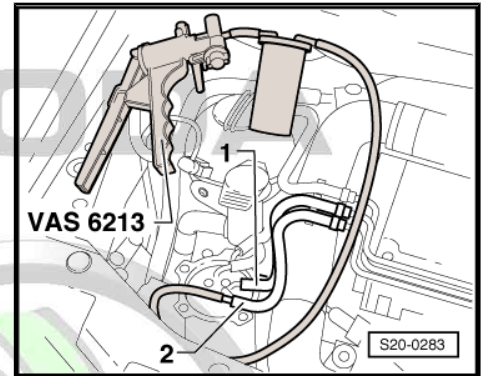
- ◆ Hand vacuum pump , e.g. -VAS 6213- or VAS 5226
- ◆ Pliers for spring strap clamps

### Conditions

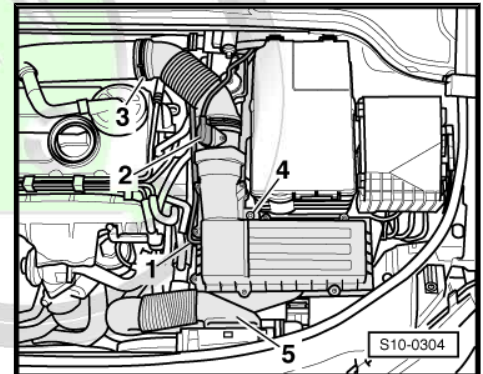
- Ignition is switched off and ignition key is withdrawn.

## Removing

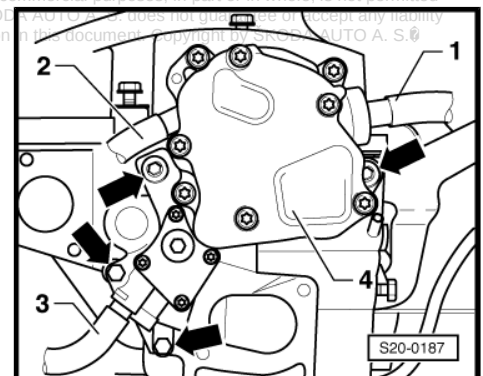
- Separate feed hose -1- (marked in white) and return-flow hose -2- (marked in blue) from the fuel filter.
- Connect hand vacuum pump with bleeder bottle (e.g. -VAS 6213- ) to return-flow hose -2-.
- Generate vacuum with hand vacuum pump until there is no more fuel from the return-flow pipe. Ensure that no fuel is drawn into the hand vacuum pump.



- Unplug connector -2- from the air mass meter -G70- .
- Disconnect ventilation hose -1- and air guide hoses -3- and -5-.
- Slacken screw -4- and remove air filter housing.



- Separate vacuum line -1- for brake servo unit from tandem pump -4-.
- Pull out the central plug for the unit injectors.
- Separate feed hose -2- (marked in white) and return-flow hose -3- (marked in blue) on the tandem pump -4-.
- Unscrew fixing screws -arrows-.
- Remove tandem pump -4- from cylinder head.



## Install

Installation is performed in the reverse order, pay attention to the following points:



### Note

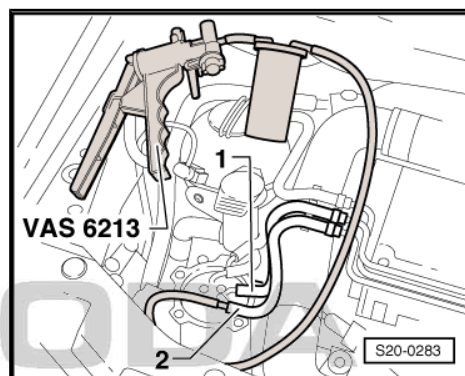
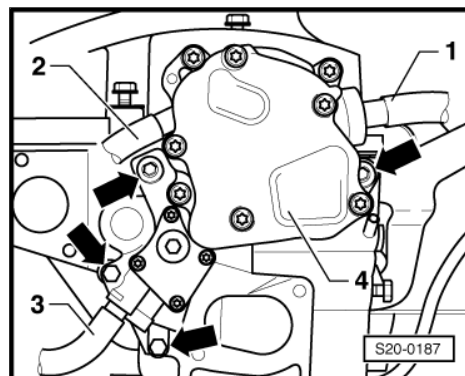
- ◆ Ensure the tandem pump coupling is correctly inserted into the camshaft.
- ◆ Always replace the tandem pump seals.

- Connect return-flow hose -3- (marked in blue) to the return-flow coupling of the tandem pump.
- Install tandem pump and tighten the top fixing screws M8 to 20 Nm.
- Tighten M6 fixing screws to 8 Nm.
- Connect the feed hose -2- (marked in white) to the feed connection and the vacuum line -1- of the brake servo unit to the tandem pump -4-.
- Connect central plug for unit injectors.
- Install charge air pipe and air filter.
- Connect the hand vacuum pump with the bleeder bottle (e.g. -VAS 6213- ) to the return-flow hose -2- (blue marking) of the fuel filter.
- Generate vacuum with hand vacuum pump until there is fuel from the return-flow pipe. Ensure that no fuel is drawn into the hand vacuum pump.
- Connect return-flow hose -2- (marked in blue) to fuel filter.



#### Note

Faults are stored as a result of separating the central plug connection for the unit injector. Interrogate the fault memory and delete it as required.



## 1.15 Inspecting a tandem pump

### Special tools and workshop equipment required

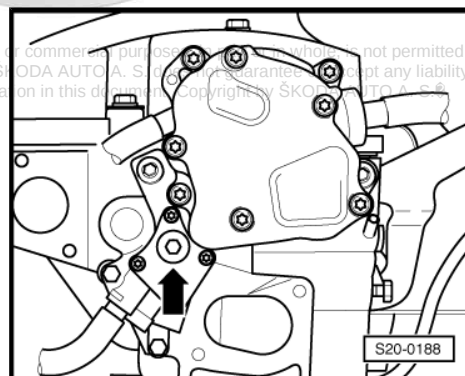
- ◆ Tandem pump testing device -VAS 5187-
- ◆ Pliers for spring strap clamps
- ◆ Hose clamp -MP7-602 (3094)-

### Test conditions

- The coolant temperature must be at least 85°C.
- Unit injectors O.K.
- Fuel filter and fuel line must not be blocked.

### Procedure

- Release screw plug -arrow-.



Protected by copyright. Copying for private or commercial purposes without permission is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

- Connect pressure gauge appliance -VAS 5187- as shown.
- Start engine and run in idle.
- Note the pressure shown on the manometer. Specified value: at least 3.5 bar (0.35 MPa).
- Engine speed must increase to 4000 rpm.
- Note the pressure shown on the manometer. Specified value: at least 7.5 bar (0.75 MPa).

If the nominal value of min. 7.5 bar (0.75 MPa) is not reached:

- Close return-flow line between tandem pump and fuel filter with hose clamp -MP7-602 (3094)- .
- Start engine and engine speed must increase to 4000 rpm.
- Note the pressure shown on the manometer. Specified value: min. 0.75 MPa (7.5 bar).

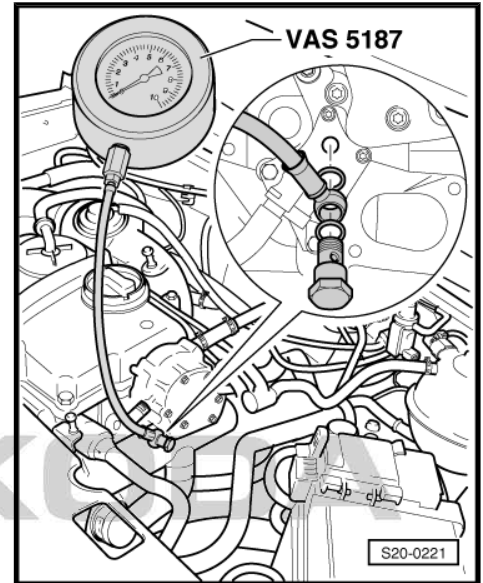
If the specified value is reached:

Pressure loss at the unit injectors.

- Replace O-rings for unit injectors.

If the specified value is still not reached:

- Replace tandem pump ➔ [page 136](#) .



**i Note**

*After removing the pressure gauge appliance tighten the plug to 25 Nm. Always replace the gasket ring.*

**Check tightness (internally)**

**i Note**

*After re-installing a used tandem pump e.g. after changing or repairing a cylinder head and/or after changing a hopper motor the tandem pump must be checked for internal tightness between fuel and oil side. In case of leakage the fuel penetrates into the engine oil, which can cause severe engine damage.*

**Special tools and workshop equipment required**

- ◆ Tester -V.A.G 1687 -

**Procedure**

- Disconnect the fuel feed hose (white marking) and the fuel return hose (blue marking) from the tandem pump.
- Close fuel return-flow connection at tandem pump with a dummy plug. Secure the dummy plug with a spring strap clamp.

Prepare tester -V.A.G 1687- as follows:





- Unscrew pressure control valve -2- fully and close the valves -3- and -4-.
- Connect tester -5- with a commercially available connection for compressed air and a piece of fuel hose to the fuel feed connection of the tandem pump. To secure use a spring strap clamp.

**Note**

*The rotary knob must be slightly pulled to the top in order to rotate the pressure control valve -2-.*

- Connect hose with compressed air -1- (compressed air supply) to tester -V.A.G 1687- .

**Note**

*If there is water in the inspection glass, drain water via the drain plug -6-.*

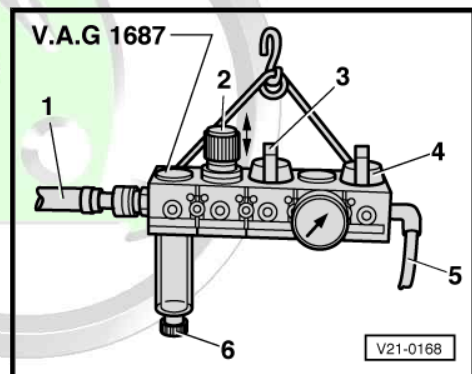
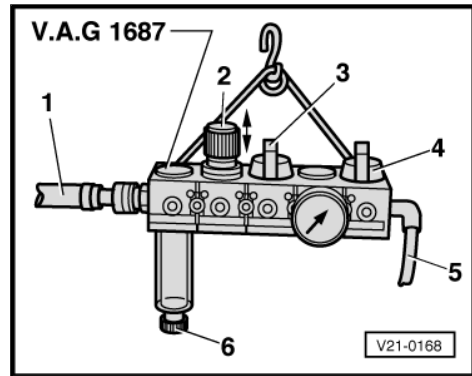
- Open valve -3-.
- Set the pressure to 1.0 bar (0.1 MPa) with the pressure control valve -2-.

**WARNING**

***The maximum test pressure is 1.3 bar (0.13 MPa) and must not be exceeded.***

- Open valve -4- and wait until the test circuit is filled. If necessary regulate the pressure to 1.0 bar (0.1 MPa).
- Close the valve -3- to maintain the pressure and observe the drop in pressure over a period of 1 minute.

If no drop in pressure is detected, the tandem pump can be used again; in case of drop in pressure replace the tandem pump.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

## 2 Accelerator control

### 2.1 Accelerator pedal module - Summary of components

#### 1 - Connector

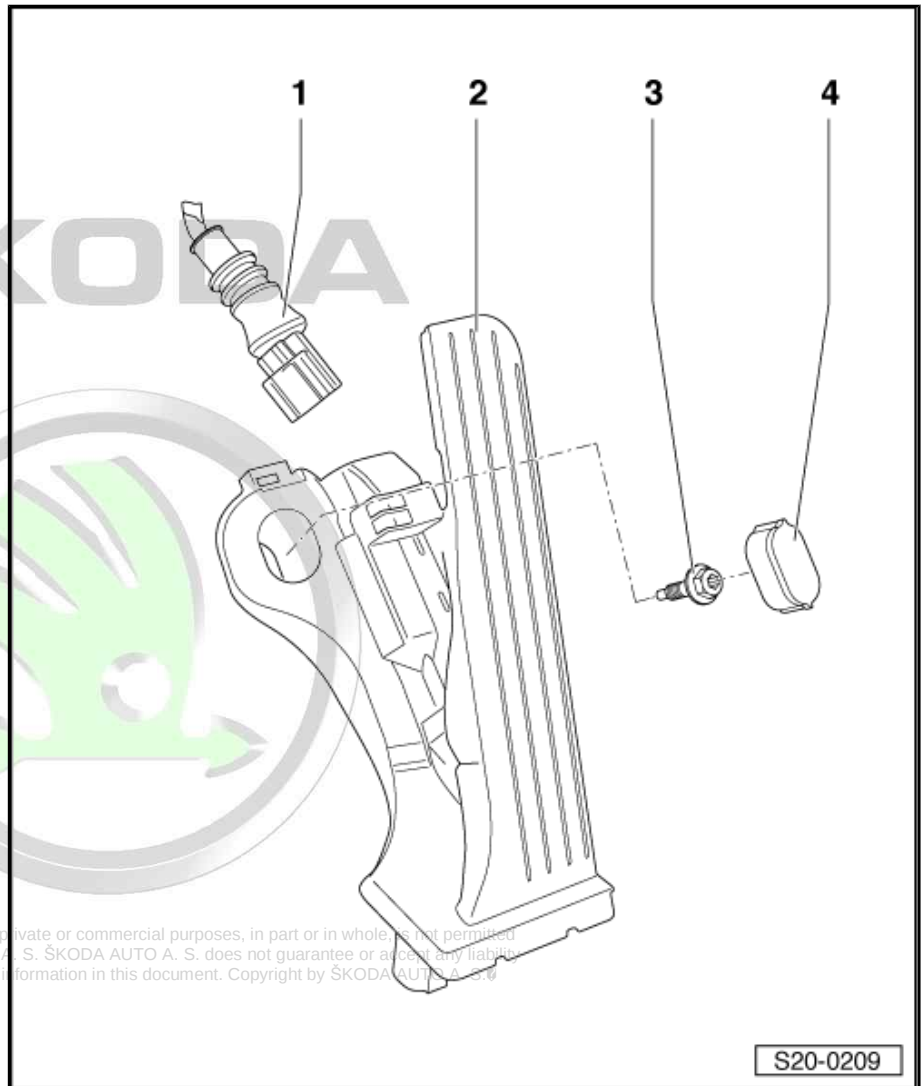
- ☐ black
- ☐ 6-pin

#### 2 - Accelerator pedal module

- ☐ with accelerator pedal position sender - G79- and accelerator pedal position sender 2 - G185-
- ☐ with kick-down-force element
- ☐ not adjustable
- ☐ to remove, release with -T10238- , or -T10240-
- ☐ removing and installing  
⇒ [page 141](#)

#### 3 - 10 Nm

#### 4 - Cap



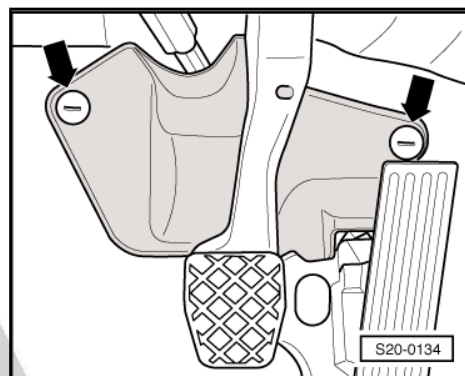
### 2.2 Removing and installing accelerator pedal module

#### Special tools and workshop equipment required

- ◆ Release tool -T10238- , or -T10240 -

## Removing

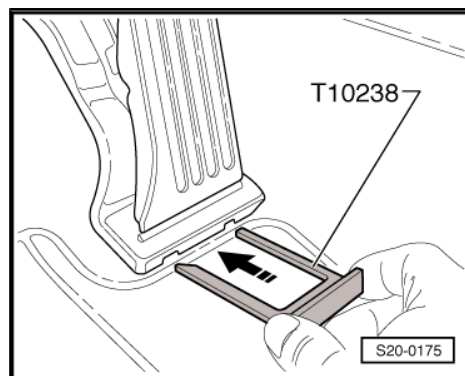
- Remove trim panel for steering column -arrows-.
- Unplug connector at accelerator pedal module.
- Remove cap in module upwards.
- Unscrew securing bolt.



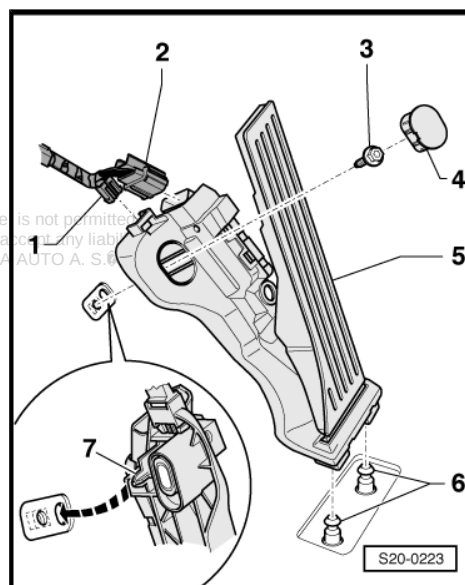
- Insert release tool -T10238- (on vehicles with right-hand steering release tool -T10240- ) in the corresponding openings up to the stop.
- Remove accelerator pedal module.

## Install

Installation is carried out in the reverse order. Pay attention to the following:



- Insert cable line -1- and connector -2- on the accelerator pedal module.
- Push accelerator pedal module onto fixing bolts -6-.
- Insert centering pin -7- in the opening in the vehicle floor.
- Screw on accelerator pedal module with fixing screws -3-, tighten to 10 Nm and push on cap -4-.
- Install cover in the footwell.



## 21 – Turbocharging

### 1 Charge-air system with exhaust gas turbocharger - Part 1

#### Note

- ◆ Regulations concerning cleanliness when working on the exhaust gas turbocharger ⇒ [page 4](#).
- ◆ General instructions for charge air system with exhaust gas turbocharger ⇒ [page 5](#).

#### 1.1 Connection diagram for vacuum hoses for engine with identification characters BJB, BKC, BXE

##### 1.1.1 Engine with identification characters BJB

##### 1 - Vacuum reservoir

##### 2 - Mechanical exhaust gas recirculation valve

##### 3 - To vacuum setting element of charge pressure control

##### 4 - To vacuum setting element of intake manifold flap

##### 5 - Valve block

- ☐ Component parts of the valve block are:

- ◆ Changeover valve for intake manifold flap -N239-
- ◆ Exhaust gas return valve -N18-
- ◆ Solenoid valve for charge pressure control -N75-

- ☐ Connection diagram ⇒ [page 144](#)

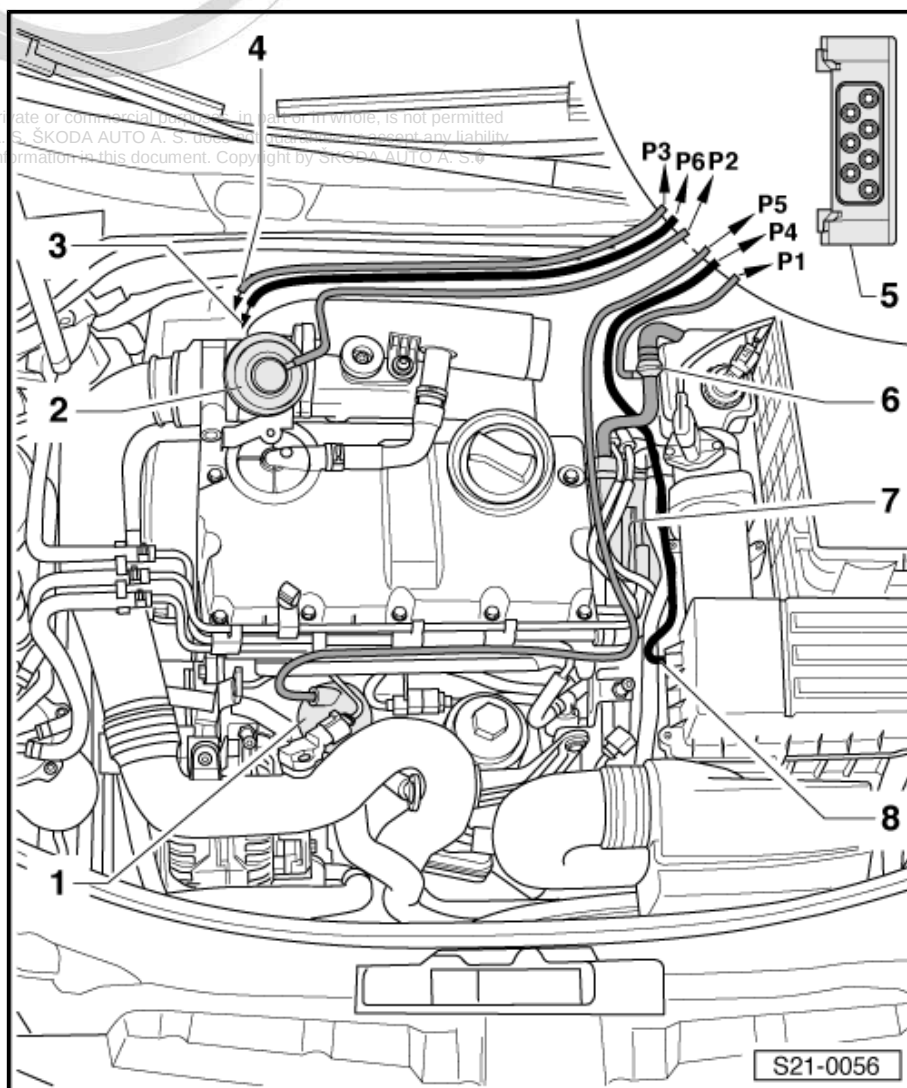
##### 6 - Vacuum line

- ☐ from the tandem pump to the valve block

##### 7 - Tandem pump

##### 8 - Ventilation hose

- ☐ to air filter



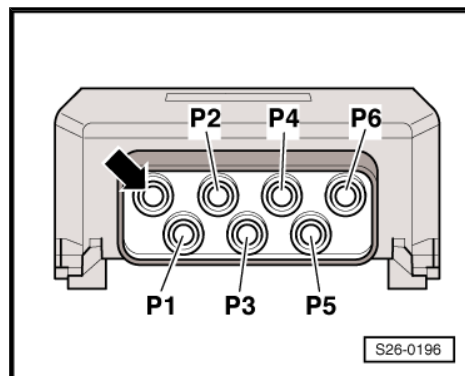
### Connection diagram for valve block

- P1 - Vacuum line from the tandem pump
- P2 - To mechanical exhaust gas recirculation valve
- P3 - To vacuum setting element of intake manifold flap
- P4 - Ventilation hose to air filter
- P5 - To vacuum reservoir
- P6 - To vacuum setting element of charge pressure control



#### Note

*The vacuum connection marked with -arrow- is not used and it is closed with the cap.*



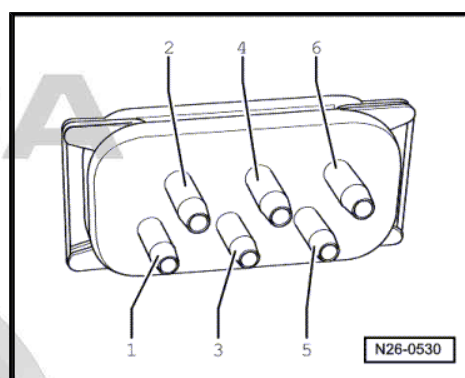
### Connection diagram for vacuum sockets



#### Note

*The side for the hose connection is shown in the fig.*

- 1 - Vacuum line from the tandem pump
- 2 - To mechanical exhaust gas recirculation valve
- 3 - To vacuum setting element of radiator for exhaust gas recirculation
- 4 - Ventilation hose to air filter
- 5 - To vacuum reservoir
- 6 - To vacuum setting element of charge pressure control



## 1.1.2 Engine with identification characters BKC, BXE

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



**1 - Vacuum reservoir**

**2 - Mechanical exhaust gas recirculation valve**

**3 - To vacuum setting element of charge pressure control**

**4 - Vacuum setting element for shift flap of exhaust gas recirculation radiator**

**5 - Valve block**

- ☐ Component parts of the valve block are:

- ◆ Changeover valve for radiator of exhaust gas recirculation -N345-

- ◆ Exhaust gas return valve - N18-

- ◆ Solenoid valve for charge pressure control -N75-

- ☐ Connection diagram  
⇒ [page 145](#)

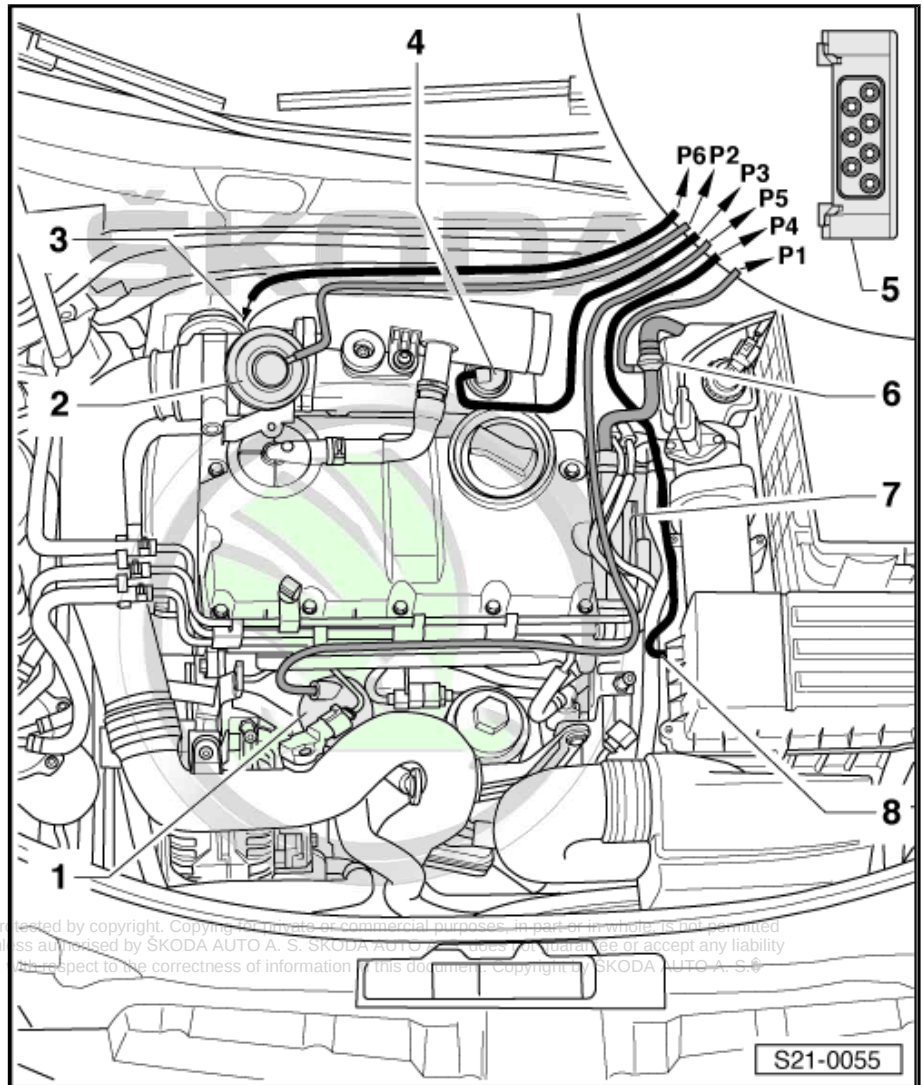
**6 - Vacuum line**

- ☐ from the tandem pump to the valve block

**7 - Tandem pump**

**8 - Ventilation hose**

- ☐ to air filter



**Connection diagram for valve block**

P1 - Vacuum line from the tandem pump

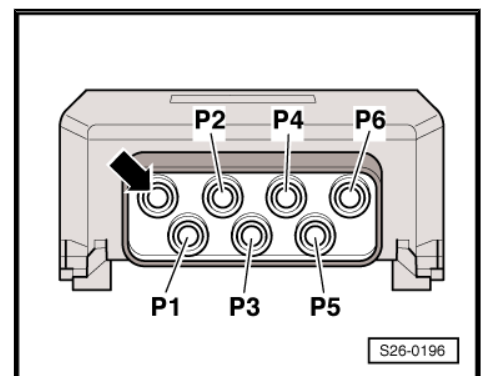
P2 - To mechanical exhaust gas recirculation valve

P3 - To vacuum setting element for shift flap of exhaust gas recirculation radiator

P4 - Ventilation hose to air filter

P5 - To vacuum reservoir

P6 - To vacuum setting element of charge pressure control



**Note**

*The vacuum connection marked with -arrow- is not used and it is closed with the cap.*

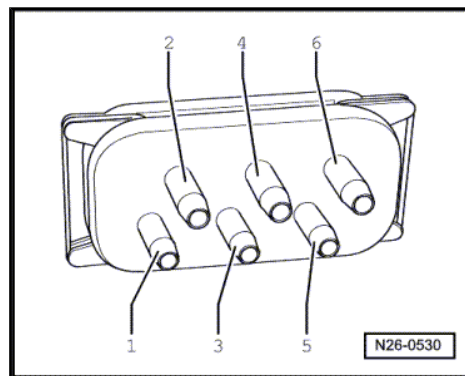
## Connection diagram for vacuum sockets



### Note

The side for the hose connection is shown in the fig.

- 1 - Vacuum line from the tandem pump
- 2 - To mechanical exhaust gas recirculation valve
- 3 - To vacuum setting element of radiator for exhaust gas recirculation
- 4 - Ventilation hose to air filter
- 5 - To vacuum reservoir
- 6 - To vacuum setting element of charge pressure control



## 1.2 Connection diagram for vacuum hoses for engine with identification characters BLS

1 - Exhaust gas turbocharger

2 - Charge air cooler

3 - Air intake hose

4 - Non-return valve

5 - Brake servo unit

6 - Solenoid valve for charge pressure control -N75-

7 - Air filter

8 - Changeover valve for radiator of exhaust gas recirculation -N345-

9 - Tandem pump

10 - Cylinder head

11 - Intake manifold

12 - Vacuum reservoir

13 - Exhaust pipe

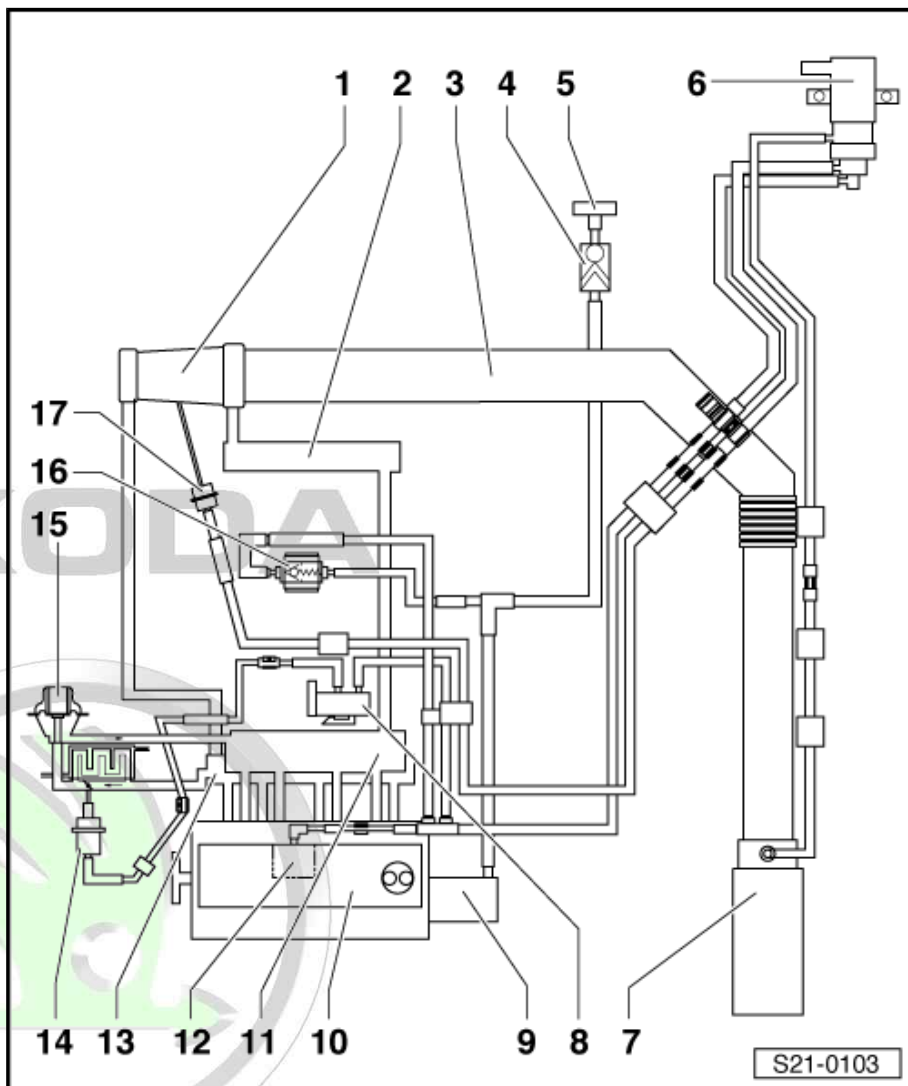
14 - Vacuum setting element

- ☐ for recirculation flap
- ☐ must be changed together with exhaust gas recirculation radiator

15 - Exhaust gas recirculation valve -N18- with EGR potentiometer -G212- and EGR control motor -V338-

16 - Non-return valve

- ☐ white connection points to charge pressure control solenoid valve - Pos. 6 and to vacuum reservoir



## 17 - Vacuum setting element

- ☐ for charge pressure control
- ☐ Components of the exhaust gas turbocharger cannot be replaced individually

## 1.3 Inspect vacuum setting element and tension rods for charge pressure control

### Special tools and workshop equipment required

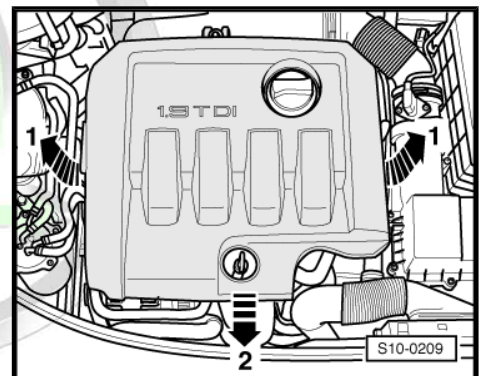
- ◆ Hand vacuum pump with accessories e.g. - V.A.G 1390- or Hand vacuum pump , e.g. - VAS 6213 -
- ◆ Turbocharger tester , e.g. - V.A.G 1397 A-

Faults at tension rods or at vacuum setting element of charge pressure control lead to the following faults:

- ◆ Specified values for charge pressure are not reached.
- ◆ Poor performance.
- ◆ Irregular performance in the partial load region.
- ◆ Engine jerk in change-over.
- Check vacuum piping for tightness and completeness  
⇒ [page 143](#) .

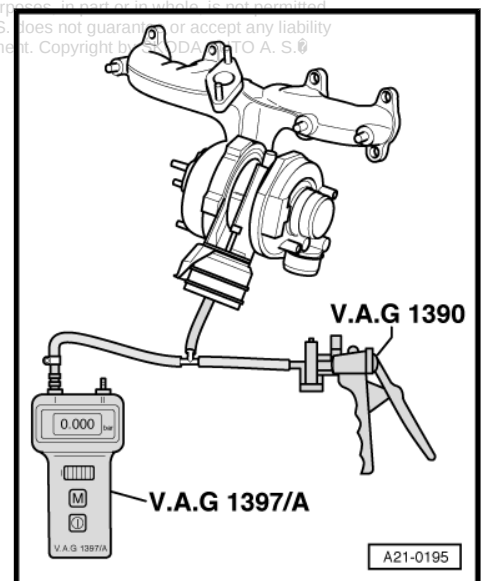
### Test sequence

- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.



- Connect hand vacuum pump and turbocharger tester with auxiliary hoses as shown. Fit test hose onto the connection fitting -I- and put the band switch of the unit into the position -I- (absolute pressure).

- Generate vacuum with hand vacuum pump.





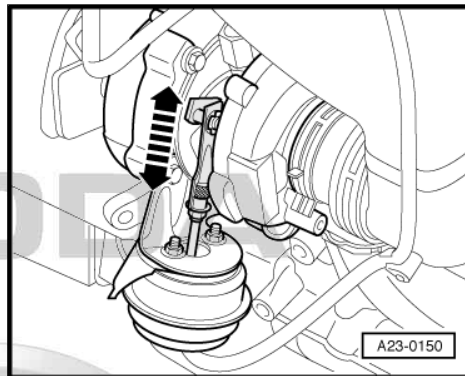
- Read off vacuum value at turbocharger tester -V.A.G 1397 A- and at the same time observe tension rod of exhaust turbocharger:



#### Note

*For the inspection use a mirror.*

- Specified value: 50 ...120 mbar (0.005...0.012 MPa): the tension rod must move up.
- Specified value: 550...620 mbar (0.055...0.062 MPa): the tension rod must be positioned at the top up to the stop.



#### Note

*The absolute pressure indicated on the turbocharger tester - V.A.G 1397 A - must decrease to the stated specified values.*

- Ventilate hand vacuum pump.
- Tension rod must move down.



#### Note

*Check tension rod movement over the entire adjustment range:  
Tension rod must move without jolting.*

If the specified values are not achieved or the tension rod moves with jolt:

- Replace turbocharger.
- ♦ Engine identification characters BJB, BKC, BXE:  
⇒ [page 152](#)
- ♦ Engine identification characters BLS: ⇒ [page 155](#)

Printed by copyright. Copying, in whole or in part, or for commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 2 Charge-air system with exhaust gas turbocharger - Part 2

### 2.1 Exhaust turbocharger - Summary of components

#### 2.1.1 Summary of components for engine with identification characters BJB

##### 1 - 25 Nm

- ☐ replace
- ☐ Coat thread with hot bolt paste -G 052 112 A3-

##### 2 - Connecting tube

- ☐ for exhaust gas recirculation
- ☐ pay attention to Part No.

##### 3 - Gasket

- ☐ replace

##### 4 - Support

- ☐ for oil feed line

##### 5 - to mechanical exhaust gas recirculation valve

##### 6 - 10 Nm

##### 7 - Oil feed line

- ☐ Check oil feed line for continuity before installing.
- ☐ Fill the exhaust turbocharger with engine oil through the connection fitting of the oil feed line before installing

##### 8 - Union nut - 22 Nm

##### 9 - Connection fittings - 30 Nm

##### 10 - Gasket ring

- ☐ replace

##### 11 - Gasket

- ☐ replace
- ☐ Check fitting position

##### 12 - Exhaust gas turbocharger

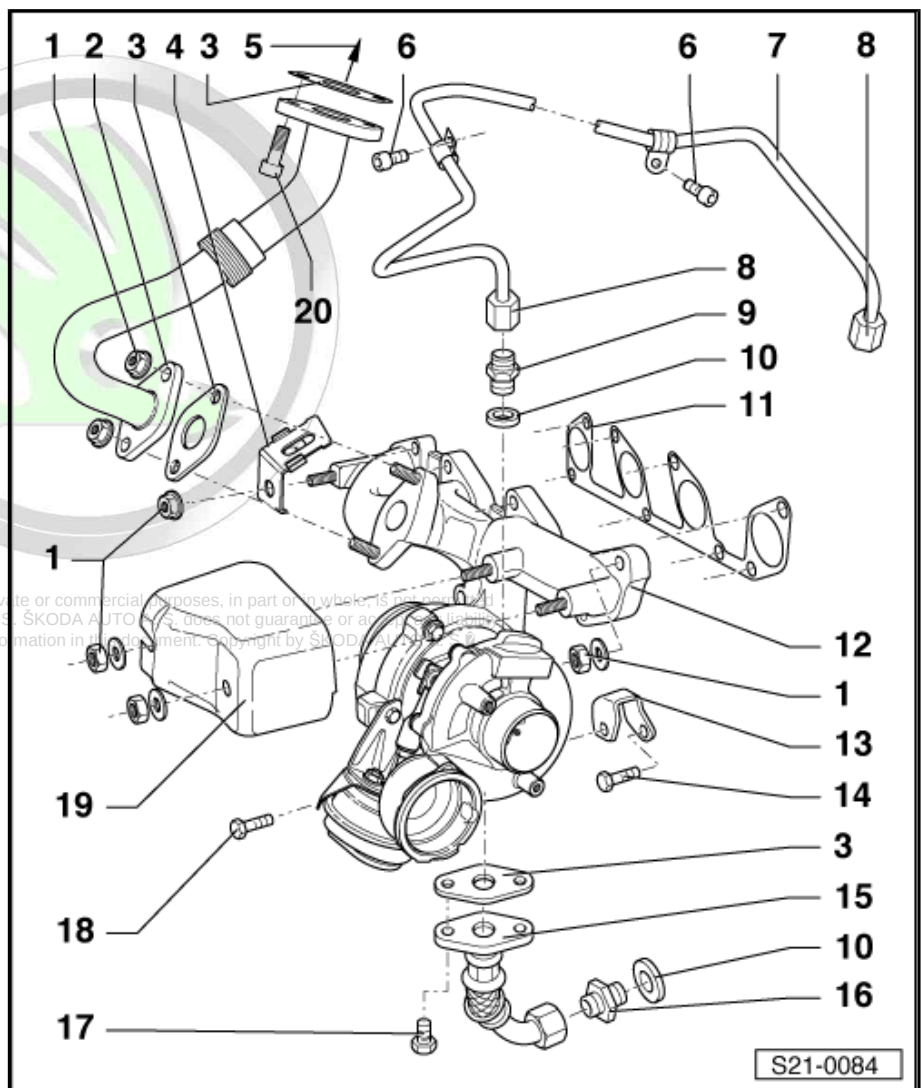
- ☐ can only be replaced complete with exhaust manifold and vacuum setting element of charge pressure control
- ☐ removing and installing [⇒ page 152](#)

##### 13 - Support

- ☐ between turbocharger and the cylinder block

##### 14 - 40 Nm

- ☐ tighten all bolts first of all by hand





**15 - Oil return line**

- ☐ in the cylinder block
- ☐ Tighten union nut to 30 Nm

**16 - Connection fittings - 40 Nm****17 - 17 Nm****18 - 20 Nm**

- ☐ tighten all bolts first of all by hand

**19 - Shield****20 - 22 Nm****2.1.2 Summary of components for engine with identification characters BKC, BXE****1 - Gasket**

- ☐ replace

**2 - to changeover valve of exhaust gas recirculation radiator****3 - 25 Nm**

- ☐ replace
- ☐ Coat thread with hot bolt paste -G 052 112 A3-

**4 - Connecting tube**

- ☐ for exhaust gas recirculation
- ☐ pay attention to Part No.

**5 - Support**

- ☐ for oil feed line

**6 - 10 Nm****7 - Oil feed line**

- ☐ Check oil feed line for continuity before installing.
- ☐ Fill the exhaust turbo-charger with engine oil through the connection fitting of the oil feed line before installing

**8 - Union nut - 22 Nm****9 - Connection fittings - 30 Nm****10 - Gasket ring**

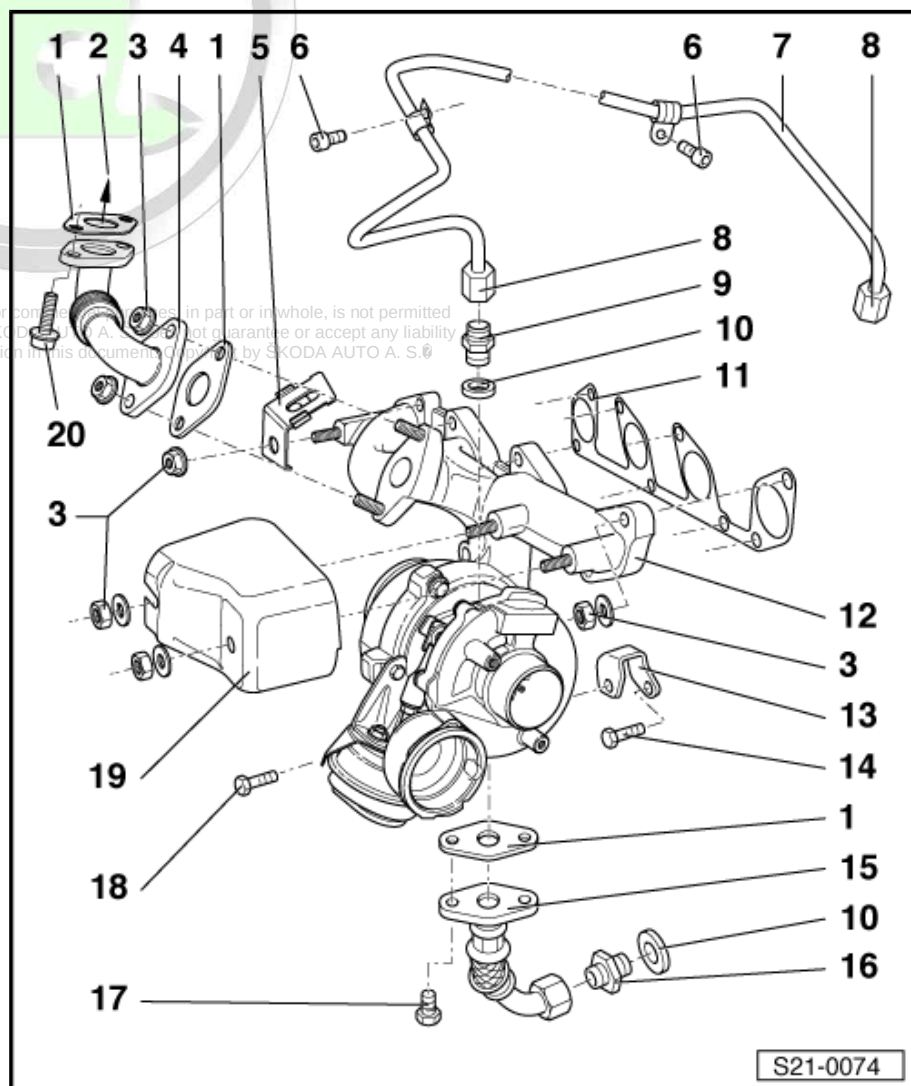
- ☐ replace

**11 - Gasket**

- ☐ replace
- ☐ Check fitting position

**12 - Exhaust gas turbocharger**

- ☐ can only be replaced complete with exhaust manifold and vacuum setting element of charge pressure control
- ☐ removing and installing ⇒ [page 152](#)



## 13 - Support

- ☐ between turbocharger and the cylinder block

## 14 - 40 Nm

- ☐ tighten all bolts first of all by hand

## 15 - Oil return line

- ☐ in the cylinder block
- ☐ Tighten union nut to 30 Nm

## 16 - Connection fittings - 40 Nm

## 17 - 17 Nm

## 18 - 20 Nm

- ☐ tighten all bolts first of all by hand

## 19 - Shield

## 20 - 22 Nm

## 2.1.3 Summary of components for engine with identification characters BLS

Protection of intellectual property rights: ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability unless authorised by ŠKODA AUTO A. S. with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 1 - 10 Nm

## 2 - Support

## 3 - Shield

## 4 - Oil feed line

- ☐ to connection fitting of oil feed line for exhaust turbocharger
- ☐ Check oil feed line for continuity before installing.
- ☐ Fill the exhaust turbocharger with engine oil through the connection fitting of the oil feed line before installing

## 5 - Vacuum setting element

- ☐ for charge pressure control
- ☐ Components of the exhaust gas turbocharger cannot be replaced individually

## 6 - Vacuum hose

## 7 - Gasket

- ☐ replace
- ☐ Check fitting position

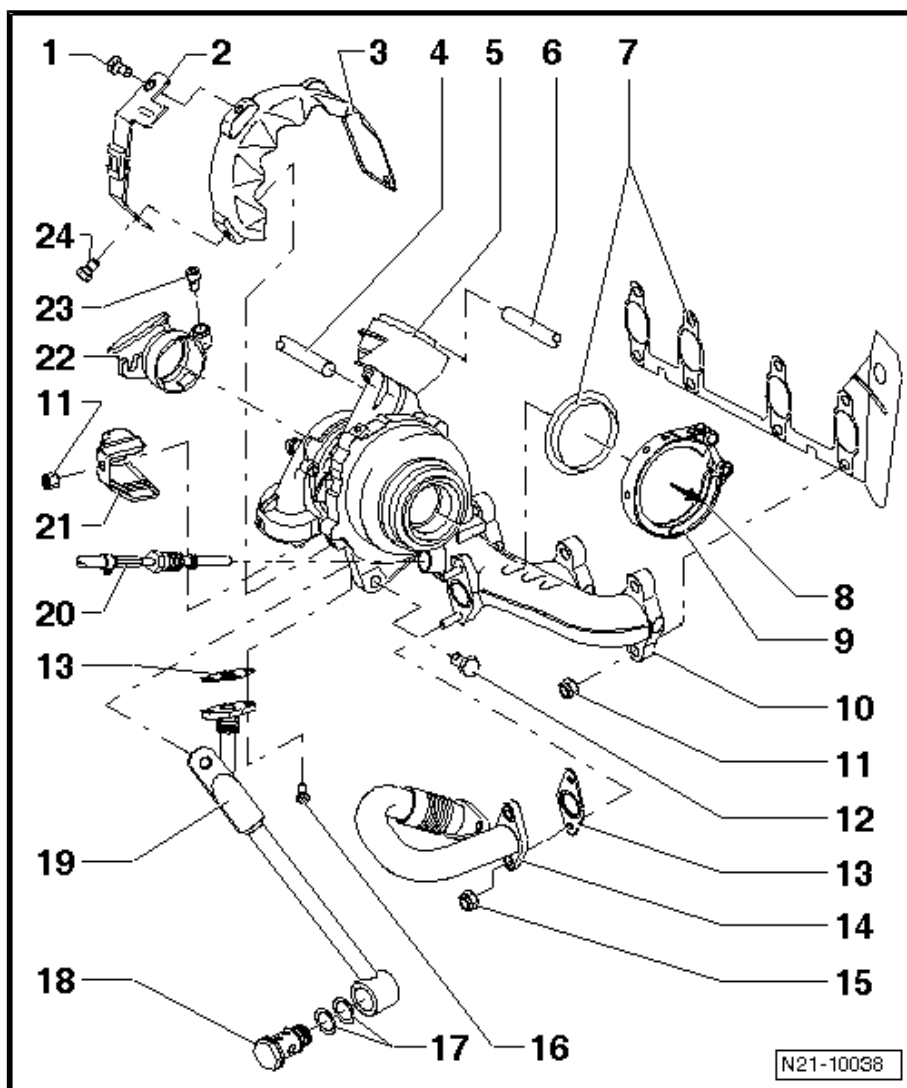
## 8 - for diesel particle filter

## 9 - Clamp - 7 Nm

- ☐ for exhaust turbocharger and diesel particle filter

## 10 - Exhaust turbocharger with exhaust manifold

- ☐ can only be replaced as one part





- ☐ removing and installing ➔ [page 155](#)

**11 - 25 Nm**

- ☐ replace

**12 - 25 Nm****13 - Gasket**

- ☐ replace

**14 - Connecting tube**

- ☐ for exhaust gas recirculation

**15 - 25 Nm**

- ☐ replace

**16 - 15 Nm****17 - O-ring**

- ☐ replace

**18 - Hollow screw - 60 Nm****19 - Support**

- ☐ for exhaust gas turbocharger
- ☐ for oil return-flow line

**20 - Exhaust gas temperature sender 1 -G235- ( Temperature sender upstream turbocharger -G507- )**

- ☐ 45 Nm
- ☐ the thread of the new temperature sender must be coated with assembly paste
- ☐ coat only the thread with hot bolt paste -G 052 112 A3- for re-used temperature sender

**21 - Shield****22 - Connection fittings**

- ☐ for intake hose between air filter and exhaust turbocharger

**23 - 9 Nm****24 - 10 Nm**

## 2.2 Removing and installing exhaust turbo-charger for engine with identification characters BJB, BKC, BXE

**Special tools and workshop equipment required**

- ◆ Pliers for spring strap clamps



### Caution

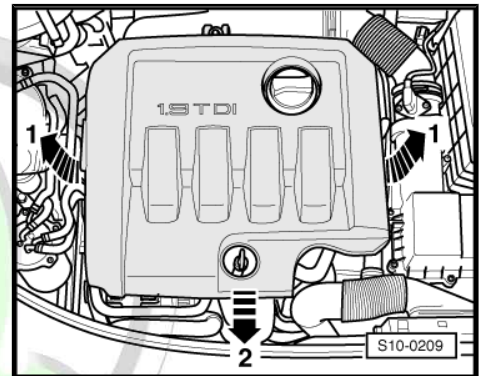
*In case of mechanical damage to the exhaust gas turbocharger, e.g. damage of the compressor wheel, it is not sufficient to only replace the exhaust gas turbocharger. In order to prevent consequential damage to the engine, perform the following tasks:*

- ◆ Check air filter housing, air filter element and charge air pipes as well as charge air hoses for soiling.
- ◆ Check all air guides and charge air cooler for foreign bodies.

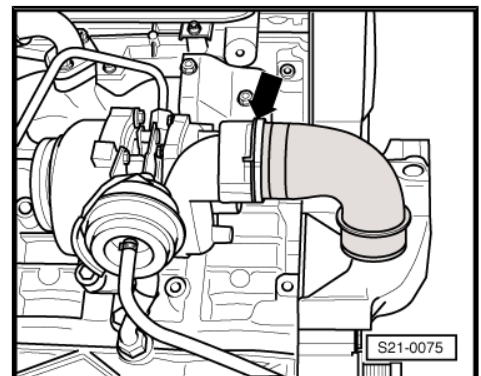
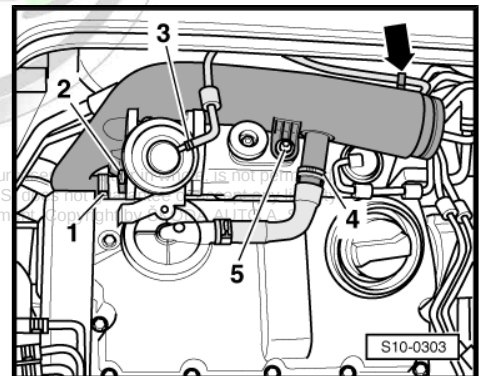
*If soiling or foreign bodies are detected in the filling system, all air guides must be carefully cleaned and if necessary replace the charge air cooler.*

### Removing

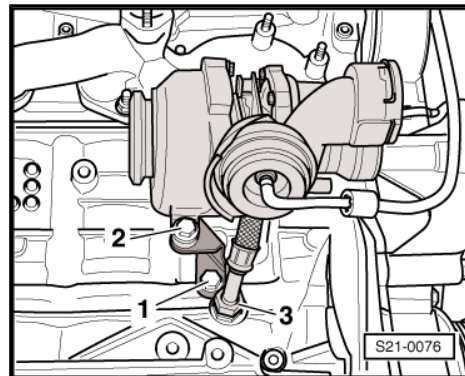
- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.



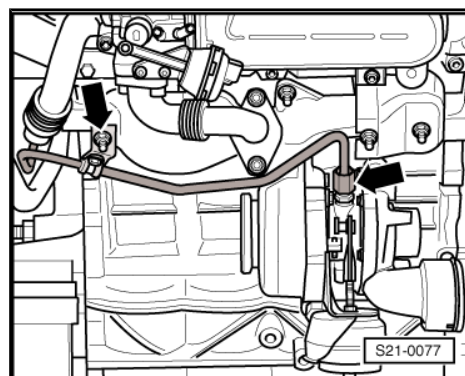
- Disconnect vacuum hose -3- from mechanical exhaust gas recirculation valve and hose to vacuum setting element of charge pressure control. Expose vacuum hoses -arrow-.
- Disconnect pipe to crankcase ventilation -4- at air guide pipe.
- Release spring strap clips -1- at exhaust turbocharger.
- Release screws -2- and -5- and remove air guide pipe.
- Remove the middle and right sound dampening system ⇒ Body Work ⇒ Rep. Gr. 50 .
- Unscrew the drive shaft to the right of the gearbox flange ⇒ Chassis ⇒ Rep. Gr. 40 .
- Remove front exhaust pipe ⇒ [page 185](#) .
- Remove air guide hose from exhaust turbocharger, to do so pull retaining clip -arrow-.



- Release screws -1- and -2- and remove bracket for turbo-charger.
- Remove the oil return line -3- at the cylinder block.



- Unscrew oil feed line at exhaust turbocharger and at exhaust manifold -arrows- and lay it to one side.
- Remove connection pipe for exhaust gas recirculation.
- Remove shield from exhaust manifold.



- Unscrew nuts -arrows- and remove exhaust manifold with ex-haust turbocharger downwards.

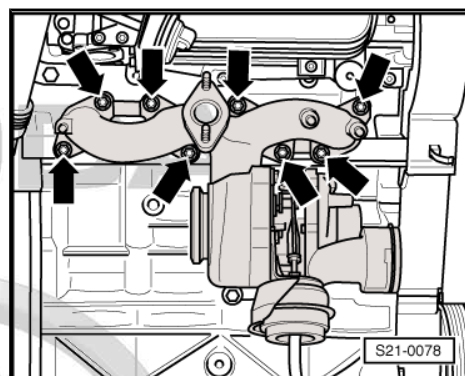
#### Install

Installation is performed in the reverse order, pay attention to the following points:



#### Note

- ◆ Replace the gaskets, the sealing rings and the self-locking nuts.
- ◆ Fill exhaust turbocharger with engine oil through the connection fitting of the oil feed line.
- ◆ Hose connections and hoses for charge air system must be free of oil and grease before being installed.
- ◆ Secure all hose connections with corresponding hose clips.
- Install exhaust system and align free of stress ⇒ [page 195](#) .
- Observe the assembly instruction for hose connections with push-fit couplings ⇒ [page 161](#) .
- Checking the oil level ⇒ Maintenance ; Octavia II .



#### Note

after installing the exhaust turbocharger run the engine approx. 1 minute in idle and do not increase speed immediately in order to ensure the supply of oil to the turbocharger.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability for the content of this document. Copyright by ŠKODA AUTO A. S. ©



## 2.3 Removing and installing exhaust turbocharger for engine with identification characters BLS

### Special tools and workshop equipment required

- ◆ Set of tools SW 17 -T10395 -
- ◆ Pliers for spring strap clamps



#### Caution

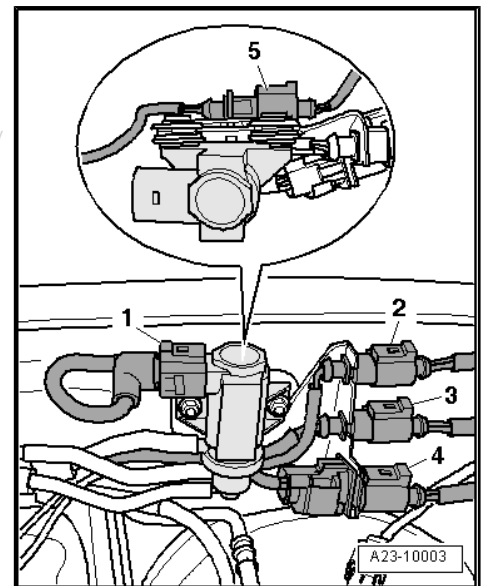
*In case of mechanical damage to the exhaust gas turbocharger, e.g. damage of the compressor wheel, it is not sufficient to only replace the exhaust gas turbocharger. In order to prevent consequential damage to the engine, perform the following tasks:*

- ◆ *Check air filter housing, air filter element and charge air pipes as well as charge air hoses for soiling.*
- ◆ *Check all air guides and charge air cooler for foreign bodies.*

*If soiling or foreign bodies are detected in the filling system, all air guides must be carefully cleaned and if necessary replace the charge air cooler.*

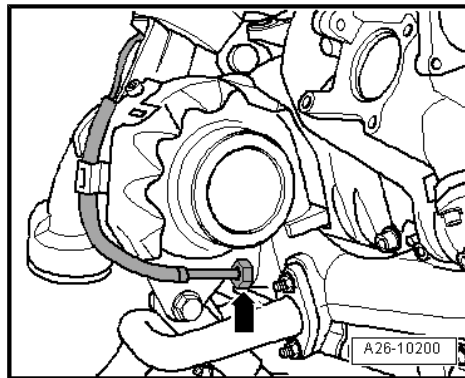
### Removing

- Switch off ignition and withdraw ignition key.
- Disconnect plug -5- for exhaust temperature sender 1 -G235- ( temperature sender upstream turbocharger - G507- ) and slacken cable.
- Remove front exhaust pipe with diesel particle filter  
⇒ [page 191](#).
- Unplug connector at air mass meter -G70- ⇒ [page 168](#) .
- Remove the connection pipe ⇒ [page 175](#) .
- Remove intake hose.
- Remove connection fitting.
- Remove vacuum line to vacuum setting element.
- Detach the oil feed line from the exhaust turbocharger.
- Loosen the screw for right drive shaft ⇒ Chassis ⇒ Rep. Gr. 40 .
- Unscrew right coupling rod ⇒ Chassis ⇒ Rep. Gr. 40 .
- Pull the drive shaft out of the wheel hub.
- Remove the air guide hose from the exhaust turbocharger  
⇒ [page 159](#) .
- Remove the connection pipe ⇒ [page 197](#) .

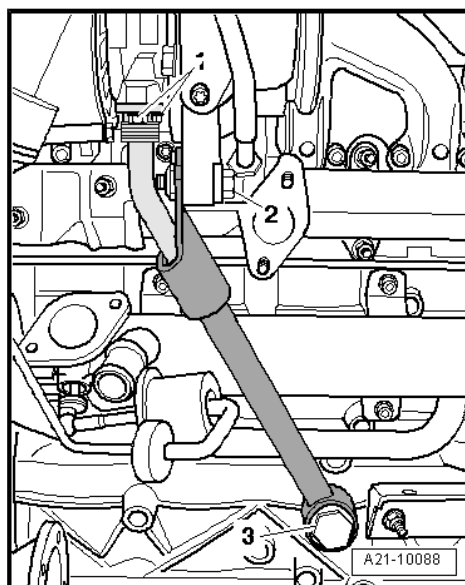




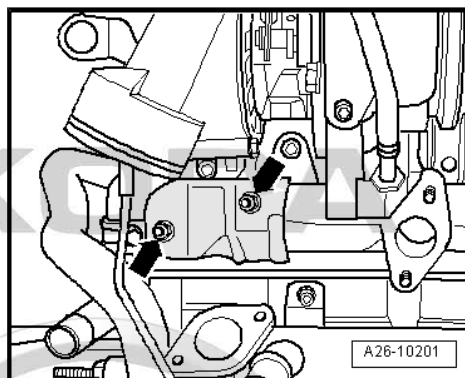
- Remove exhaust gas temperature sender 1 -G235- ( temperature sender upstream turbocharger -G507- ) -arrow- using a key from the set of tools SW 17 -T10395- .



- Release screws -1-, screw -2- and hollow screw -3-.



- Remove left shield at exhaust manifold -arrows-.
- Unscrew bracket for diesel particle filter from engine block.



- Unscrew nuts -arrows- and remove exhaust manifold with exhaust turbocharger downwards.

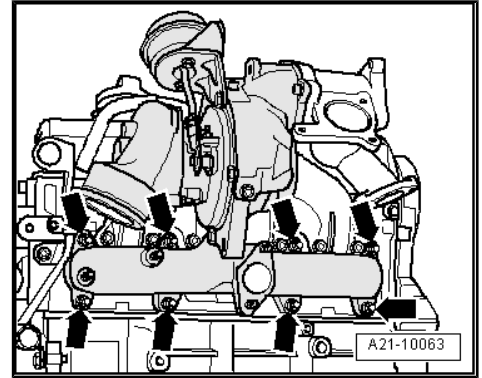
#### Install

Installation is performed in the reverse order, pay attention to the following points:



#### Note

- ◆ *Replace the gaskets, the sealing rings and the self-locking nuts.*
- ◆ *Fill exhaust turbocharger with engine oil through the connection fitting of the oil feed line.*
- ◆ *Hose connections and hoses for charge air system must be free of oil and grease before being installed.*
- ◆ *Secure all hose connections with corresponding hose clips.*
- Observe the assembly instruction for hose connections with push-fit couplings ⇒ [page 161](#) .
- Checking the oil level ⇒ Maintenance ; Octavia II .



#### Note

*after installing the exhaust turbocharger run the engine approx. 1 minute in idle and do not increase speed immediately in order to ensure the supply of oil to the turbocharger.*

## 2.4 Removing and installing parts of the charge air cooling

### 2.4.1 Summary of components for engine with engine identification characters BJB, BKC, BXE



#### Note

- ◆ *Before testing or repairing check all hoses and lines for tight connection and leaktightness.*
- ◆ *Hose connections and hoses for charge air system must be free of oil and grease before being installed.*
- ◆ *Secure all hose connections with corresponding hose clips.*



1 - 8 Nm

2 - Support

☐ Check fitting position

3 - Charge air cooler

☐ removing and installing  
⇒ [page 159](#)

4 - Connecting hose

5 - to turbocharger

6 - Charge air pipe

7 - to induction pipe with flap

8 - Vacuum reservoir

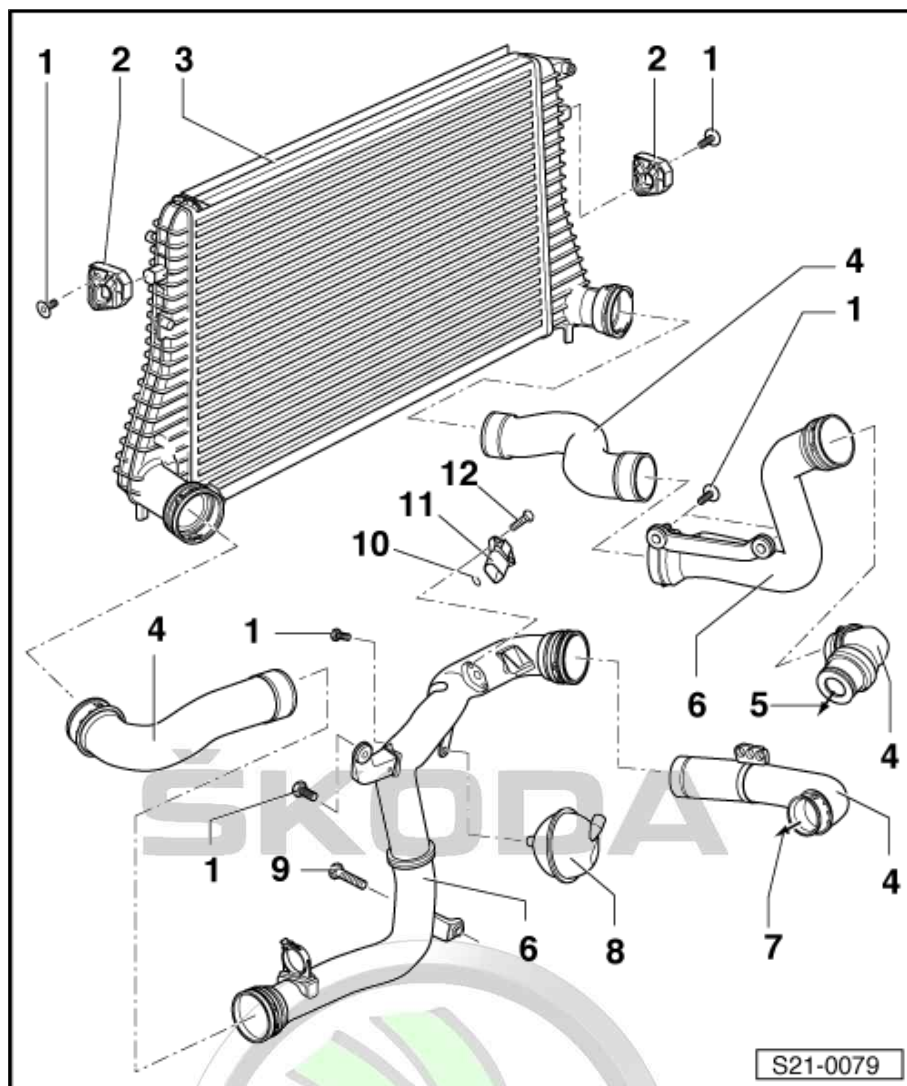
9 - 15 Nm

10 - O-ring

☐ replace

11 - Charge pressure sender -  
G31- / Intake air temperature  
sender -G42 -

12 - 3 Nm



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

## 2.4.2 Summary of components for engine with identification characters BLS

### Note

- ◆ Before testing or repairing check all hoses and lines for tight connection and leaktightness.
- ◆ Hose connections and hoses for charge air system must be free of oil and grease before being installed.
- ◆ Secure all hose connections with corresponding hose clips.

1 - 8 Nm

2 - Support

- ☐ Check fitting position

3 - Charge air cooler

- ☐ removing and installing  
⇒ [page 159](#)

4 - top seal

- ☐ fitted onto charge air cooler

5 - 3 Nm

6 - Charge pressure sender - G31- / Intake air temperature sender -G42-

7 - O-ring

- ☐ replace if damaged

8 - Support

9 - 5 Nm

10 - Connecting hose

11 - Charge air pipe

12 - Connecting hose

- ☐ for intake manifold flap motor -V157-

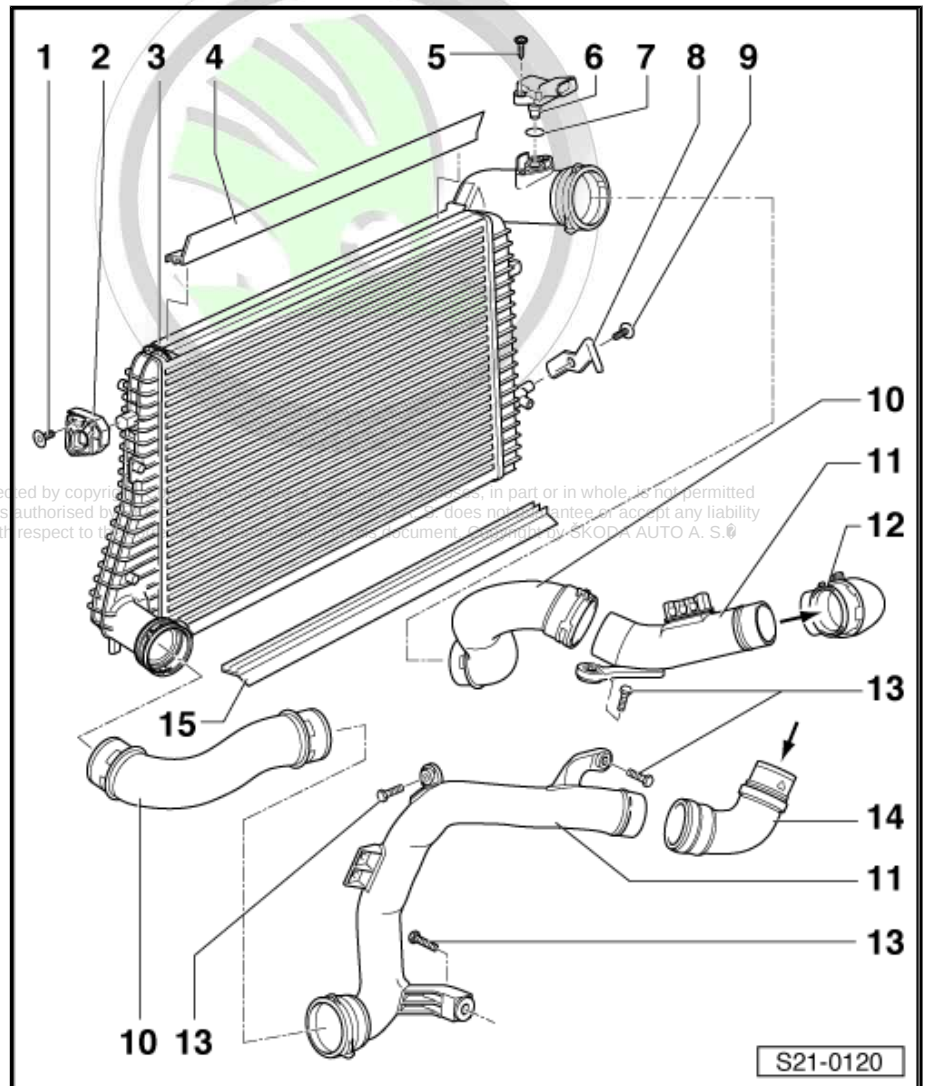
13 - 8 Nm

14 - Connecting hose

- ☐ to turbocharger

15 - bottom seal

- ☐ fitted onto charge air cooler



## 2.5 Removing and installing charge air cooler

### Removing

- Removing coolant cooler ⇒ [page 112](#) .
- Remove front bumper ⇒ Body Work ⇒ Rep. Gr. 63 .
- Detach the charge air hoses on the left and right of the charge air cooler.





# WARNING

*Refrigerant circuit of the air conditioning system must not be opened.*



# Note

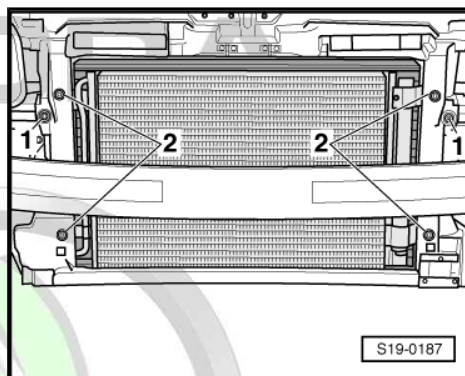
*To avoid damaging the condenser, wiring and air conditioning hoses make sure the lines and hoses are not excessively expanded, buckled or bent.*

## For vehicles with air conditioning

- Screw out the fixing screws -2- of the condenser.

## For all vehicles

- Release screws at charge air cooler.
- ♦ Engine identification characters BJB, BKC, BXE:  
⇒ [Item 1 \(page 158\)](#)
- ♦ Engine identification characters BLS: ⇒ [Item 1 \(page 159\)](#)

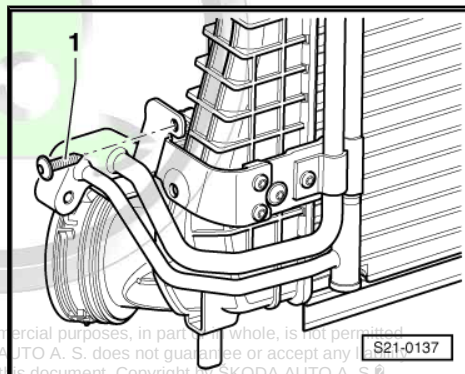


- Press off the charge air cooler from the lock carrier with the assistance of a 2nd mechanic so that the fixing screw -1- for the air conditioning lines on the radiator is accessible.
- Remove screw -1-.
- Carefully remove radiator downwards.

## Install

Installation is performed in the reverse order, pay attention to the following points:

- Install front bumper ⇒ Body Work ⇒ Rep. Gr. 63.



# Note

*Replace O-rings.*

- Observe the assembly instruction for hose connections with push-fit couplings ⇒ [page 161](#).
- Installing coolant cooler ⇒ [page 112](#).

## 2.6 Hose connections

### 2.6.1 Assembly of hose connections with push-fit couplings



#### Caution

*The gasket ring for the push-fit coupling can be damaged, if the locking clip is in the lock position during the assembly. There would be a leak in the connection. Observe the assembly instruction.*



#### Note

*All the hose connections of the charge air system are secured with spring strap clamps or push-fit couplings. For the push-fit couplings pay attention to the following points:*

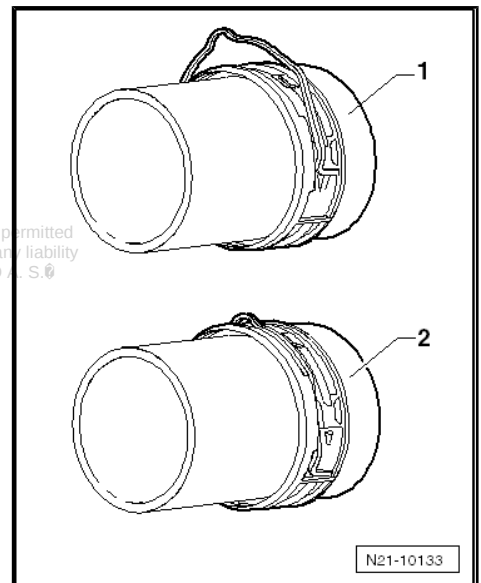
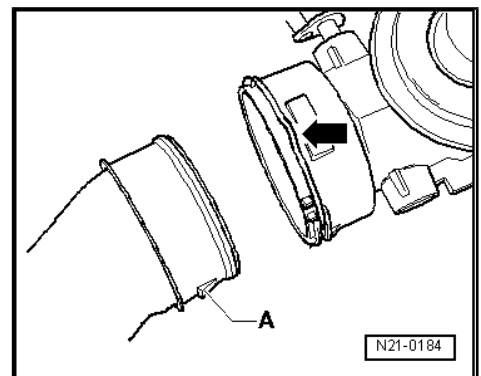
#### Removing

- Release push-fit coupling by pulling the locking clip -arrow-. Disconnect hose/pipe without auxiliary tool.

#### Install

- Observe that the retaining lugs latch when installing -A-.
- When replacing the gasket ring, place the gasket ring in the groove of the charge air hose. Make sure that the gasket ring is fully seated all round in the groove.
- Oil sealing surface and gasket ring.
- Put the locking clip into the release position -1-.
- Insert the charge air hose up to the stop into the coupling.
- Put the locking clip into the lock position -2- and then press down once again the charge air hose.
- Check hose for tight connection by pulling on it and check the correct locking of the push-fit coupling.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

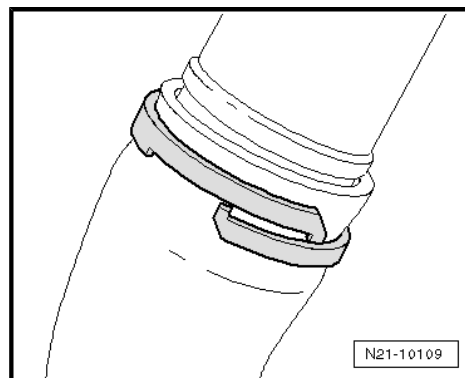


## 2.6.2 Hose connections with spring strap ring



### Note

After disassembling and assembling the charge air lines with spring strap clamps, there is a risk of the "hose slipping off" when driving. For this reason, spring strap rings are installed, which can only be opened when there is a defect of the appropriate charge air line. When carrying out repairs, the spring strap ring must be destroyed using a suitable tool and replaced by a spare part according to the ➔ Electronic Catalogue of Original Parts .



## 2.7 Check charge-air system for tightness

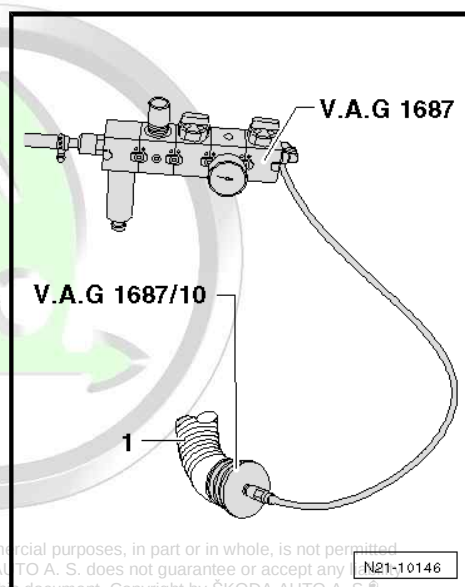
### Special tools and workshop equipment required

- ◆ Charge-air system testing device , e. g. -V.A.G 1687-
- ◆ Adapter , e.g. -V.A.G 1687/10-

### Test sequence

- Remove the intake hose -1- from the air filter.
- Fit adapter -1687/10- into the intake hose -1- and secure with a clamp.

Prepare tester for charge air system - V.A.G 1687- as follows:

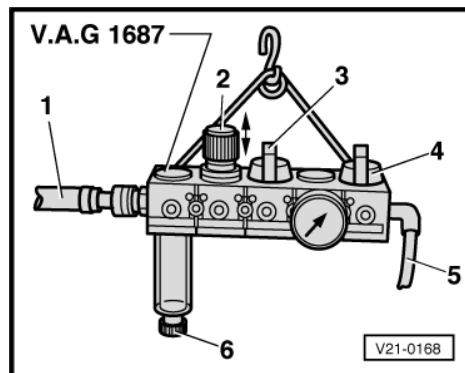


- Unscrew pressure control valve -2- fully and close the valves -3- and -4-.



### Note

The rotary knob must be pulled to the top in order to rotate the pressure control valve -2-.



- Connect tester for charge air system - V.A.G 1687- to adapter -1687/10- .
- Connect the pneumatic hose -1- (pneumatic support) to tester for charge air system.



#### Note

*If there is water in the inspection glass, drain water via the drain plug -6-.*

- Open valve -3-.
- Set the pressure to 0.05 MPa (0.5 bar) with the pressure control valve -2-.



#### Caution

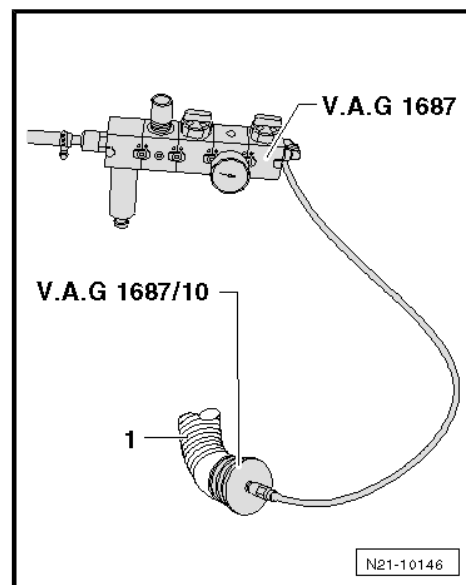
***The pressure must not be greater than 0.05 MPa (0.5 bar)! A too high pressure can damage the engine.***

- Open valve -4- and wait until the test circuit is filled up. If necessary readjust pressure to 0.05 MPa (0.5 bar).
- Listen to, touch or use commercially available leak search spray or the ultrasonic measuring device e. g. -V.A.G 1842- to check the charge-air system for leak points.



#### Note

- ◆ *Minor leaks are permissible on the suction side of the turbo-charger, because the intake hoses are not designed for over-pressure.*
- ◆ *A small amount of air penetrates via the valves into the engine. For this reason no pressure test is possible.*
- ◆ *Use of ultrasonic measuring device -V.A.G 1842- → operating instructions .*
- ◆ *In case of a leak point, observe the instructions for charge air system ⇒ [page 5](#) during the installation.*
- ◆ *Before removing the adapter, depressurize the test circuit by detaching the coupling from the adapter -1687/10- .*



## 23 – Fuel Formation, Injection

### 1 Repairing a diesel direct injection system

The control unit is equipped with a fault memory. Before repairs, setting operations and fault finding, interrogate the fault memory and execute a self-diagnosis ⇒ Vehicle diagnosis, testing and information system VAS 5051.



#### Note

*Faults can be detected by the control unit as checking and adjustment work is being undertaken and then saved. It is therefore absolutely necessary to delete the fault memory after completing all checking and adjustment work ⇒ Vehicle diagnosis, testing and information system VAS 5051*

#### Safety measures

If test and measuring devices are required during test drives observe the following:

- ◆ Always secure the test and measuring devices on the rear seat and have a second person operate them there.

If the test and measuring devices are operated from the passenger seat, the passenger could be injured by the release of the passenger airbag in the event of an accident.



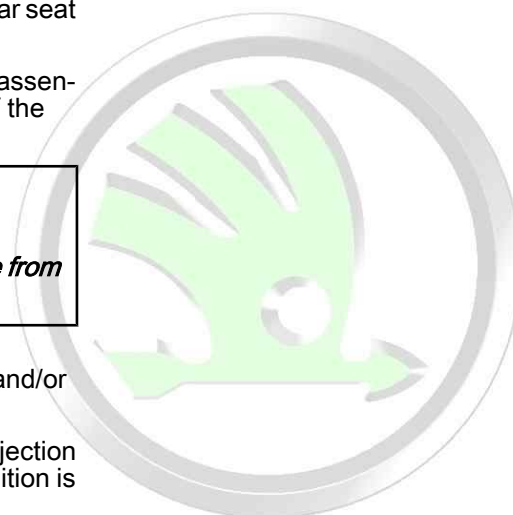
#### WARNING

***Secure the diagnostic device to the rear seat and operate from that position.***

Observe the following points to prevent injury to persons and/or damage to the injection and preheating system:

- ◆ Disconnect and connect wires of the preheating and injection system as well as measuring device wires when the ignition is switched off.
- ◆ If the engine should be run at the starter speed without it actually igniting, as for example when checking the compression pressure, then separate the central plug connection for the unit injectors at the cylinder head.
- ◆ Before disconnecting the battery determine the code of radio sets fitted with anti-theft coding.
- ◆ Switch off the ignition before connecting or disconnecting the battery as this could otherwise damage the diesel direct injection system control unit.
- ◆ When the battery is disconnected and reconnected, carry out additional operations ⇒ Electrical System ⇒ Rep. Gr. 27 .

ŠKODA





## 1.1 Overview of fitting locations

### 1.1.1 Engine with identification characters BJB

Components A through H are not represented in the overview figure.

#### A - Diesel direct injection system relay - J322-

- ☐ on the additional relay carrier under the E-box (R4)

#### B - Automatic glow period control unit -J179-

- ☐ on the additional relay carrier under the E-box (R2)

#### C - Fuel pump relay -J17-

- ☐ on the additional relay carrier under the dash panel (D4.1)

#### D - Accelerator pedal position sender -G79- and accelerator pedal position sender 2 -G185-

- ☐ in the footwell in the accelerator pedal module

#### E - Brake light switch -F- and brake pedal switch -F47-

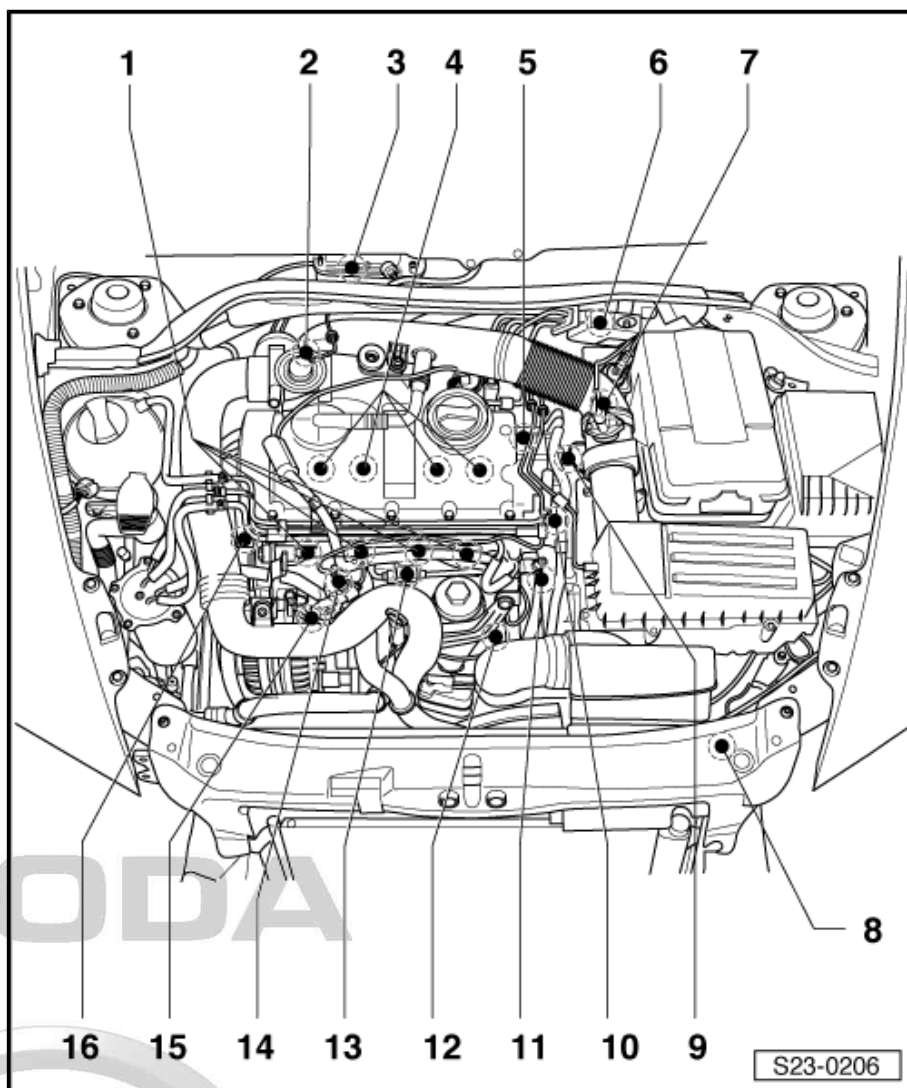
- ☐ in footwell on the brake pedal

#### F - Clutch position sender - G476-

- ☐ in the engine compartment on the slave cylinder

#### G - Engine speed sender - G28-

- ☐ at cylinder block behind flywheel
- ☐ removing and installing



⇒ [page 181](#)

#### H - Oil level and oil temperature sender -G266-

- ☐ at the engine oil pan

#### 1 - Glow plugs 1 -Q11- , 2 -Q12- , 3 -Q13- and 4 -Q14-

- ☐ Tightening torque 15 Nm
- ☐ remove and install, test ⇒ [page 204](#)

#### 2 - Induction pipe

- ☐ with mechanical exhaust gas recirculation valve
- ☐ with an intake manifold flap

#### 3 - Diesel direct injection system control unit -J248-

- ☐ with altitude sender -F96-

#### 4 - Unit injectors -N240 - , -N241- , -N242- and - N243-

- ☐ under cylinder head cover
- ☐ removing and installing, setting ⇒ [page 176](#)

#### 5 - Coolant temperature sender -G62-

#### 6 - Valve block

- ☐ Component parts of the valve block are:
- ◆ Changeover valve for intake manifold flap -N239-
- ◆ Exhaust gas return valve -N18-
- ◆ Solenoid valve for charge pressure control -N75-

#### 7 - Air mass meter -G70-

#### 8 - Coolant temperature sender at radiator outlet -G83-

#### 9 - Tandem pump

#### 10 - Plug connection

- ☐ Central plug connection for unit injectors -N240- , -N241- , -N242- and -N243- .

#### 11 - Fuel temperature sender -G81-

#### 12 - Plug connection

- ☐ for engine speed sender -G28-

#### 13 - Plug connection

- ☐ for hall sender -G40-

#### 14 - Vacuum reservoir

#### 15 - Charge pressure sender -G31- with intake air temperature sender -G42-

#### 16 - Hall sender -G40-

- ☐ under top toothed belt guard
- ☐ removing and installing ⇒ [page 54](#)

### 1.1.2 Engine with identification characters BKC, BXE

Components A through H are not represented in the overview figure.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

**A - Diesel direct injection system relay - J322-**

- ☐ on the additional relay carrier under the E-box (R4)

**B - Automatic glow period control unit -J179-**

- ☐ on the additional relay carrier under the E-box (R2)

**C - Fuel pump relay -J17-**

- ☐ on the additional relay carrier under the dash panel (D4.1)

**D - Accelerator pedal position sender -G79- and accelerator pedal position sender 2 -G185-**

- ☐ in the footwell in the accelerator pedal module

**E - Brake light switch -F- and brake pedal switch -F47-**

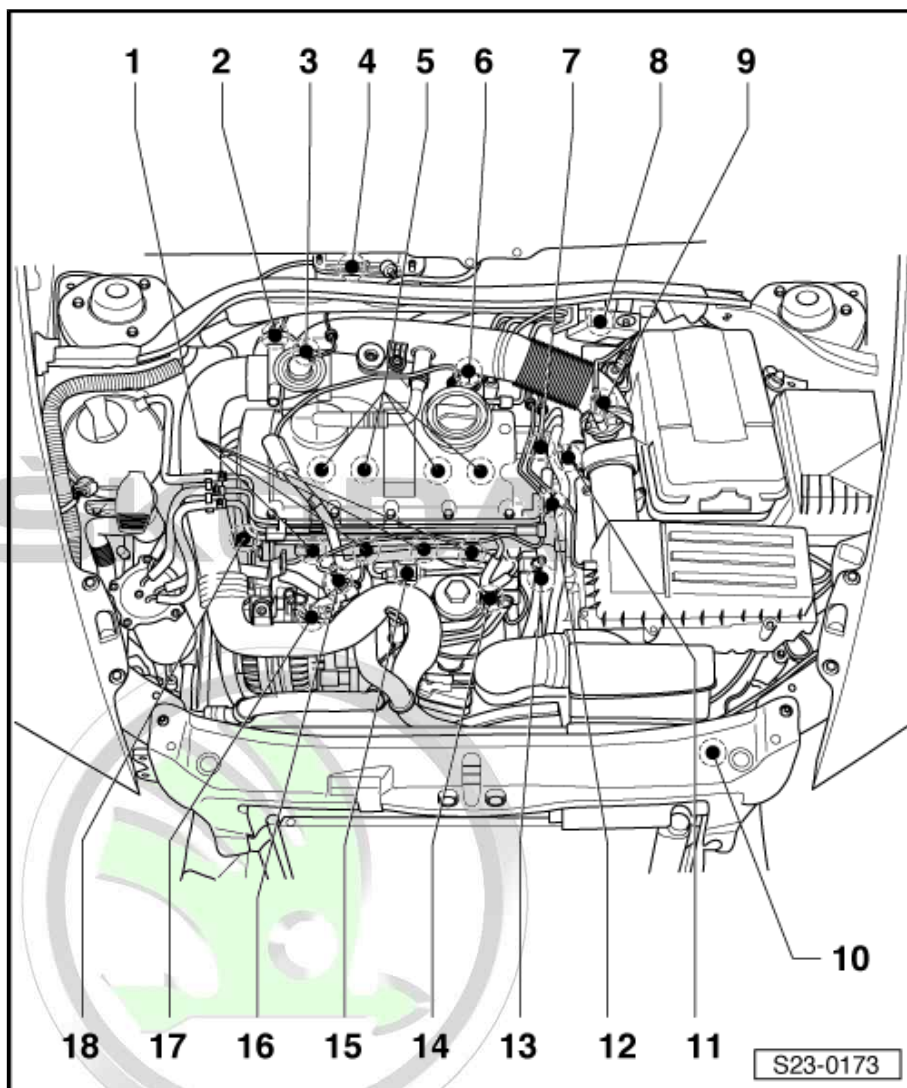
- ☐ in footwell on the brake pedal

**F - Clutch position sender - G476-**

- ☐ in the engine compartment on the slave cylinder

**G - Engine speed sender - G28-**

- ☐ at cylinder block behind flywheel
- ☐ removing and installing



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®



⇒ [page 181](#)

#### H - Oil level and oil temperature sender -G266-

- ☐ at the engine oil pan

#### 1 - Glow plugs 1 -Q11- , 2 -Q12- , 3 -Q13- and 4 -Q14-

- ☐ Tightening torque 15 Nm
- ☐ remove and install, test ⇒ [page 204](#)

#### 2 - Intake manifold flap motor -V157-

- ☐ removing and installing ⇒ [page 173](#)

#### 3 - Induction pipe

- ☐ with mechanical exhaust gas recirculation valve

#### 4 - Diesel direct injection system control unit -J248-

- ☐ with altitude sender -F96-

#### 5 - Unit injectors -N240 - , -N241- , -N242- and - N243-

- ☐ under cylinder head cover
- ☐ removing and installing ⇒ [page 178](#)

#### 6 - Vacuum setting element

- ☐ for shift flap of exhaust gas recirculation radiator
- ☐ check ⇒ [page 197](#)

#### 7 - Coolant temperature sender -G62-

#### 8 - Valve block

- ☐ Component parts of the valve block are:
- ◆ Changeover valve for radiator of exhaust gas recirculation -N345-
- ◆ Exhaust gas return valve -N18-
- ◆ Solenoid valve for charge pressure control -N75-

#### 9 - Air mass meter -G70-

#### 10 - Coolant temperature sender at radiator outlet -G83-

#### 11 - Tandem pump

#### 12 - Plug connection

- ☐ Central plug connection for unit injectors -N240- , -N241- , -N242- and -N243- .

#### 13 - Fuel temperature sender -G81-

#### 14 - Plug connection

- ☐ for engine speed sender -G28-

#### 15 - Plug connection

- ☐ for hall sender -G40-

#### 16 - Vacuum reservoir

#### 17 - Charge pressure sender -G31- with intake air temperature sender -G42-

#### 18 - Hall sender -G40-

- ☐ under top toothed belt guard
- ☐ removing and installing ⇒ [page 54](#)

### 1.1.3 Engine with identification characters BLS

Components A through G are not represented in the overview figure.

**A - Warning light for engine electronics -K83-**

- ☐ on the dash panel insert

**B - Accelerator pedal position sender -G79- with accelerator pedal position sender 2 -G185-**

- ☐ in footwell on the accelerator pedal

**C - Brake light switch -F- and brake pedal switch -F47-**

- ☐ in footwell on the brake pedal

**D - Fuel pump relay -J17-**

- ☐ on relay carrier

**E - Clutch position sender - G476-**

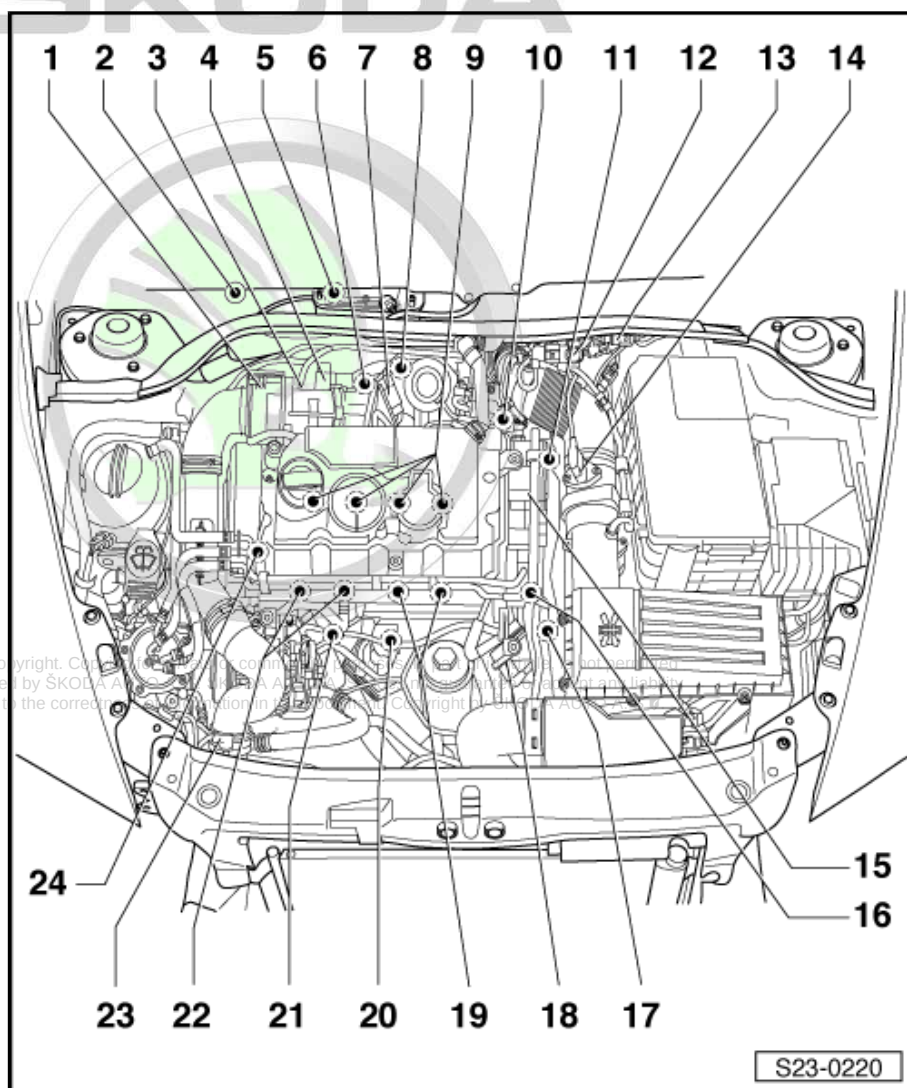
- ☐ at master cylinder

**F - Automatic glow period control unit -J179-**

- ☐ below E-box in the engine compartment

**G - Relay and fuse carrier**

- ☐ with voltage supply relay of tml. 30 -J317-
- ☐ with voltage supply relay of tml. 15 -J329-
- ☐ E-box in the engine



S23-0220



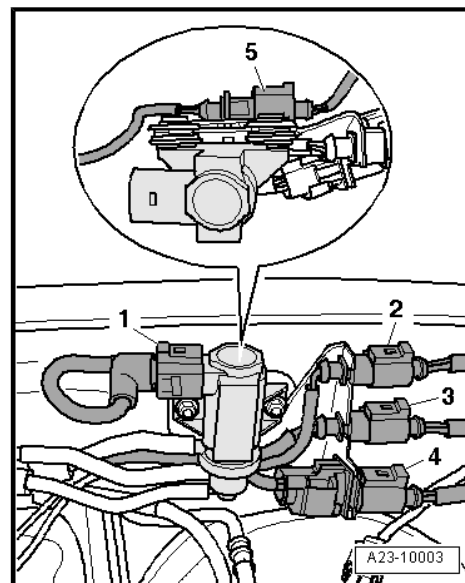
compartment

- 1 - Intake manifold flap motor -V157-
- 2 - Exhaust gas temperature sender 3 - G495- ( Temperature sender downstream particle filter -G527 - )
- 3 - Lambda probe -G39- with heating for lambda probe -Z19-
- 4 - Exhaust gas recirculation valve -N18- with EGR potentiometer -G212- and EGR control motor -V338-
- 5 - Engine control unit -J248-
- 6 - Exhaust gas temperature sender 2 - G448- ( Temperature sender upstream particle filter -G506 - )
- 7 - Pressure sensor 1 for exhaust gas -G450-
- 8 - Exhaust gas temperature sender 1 - G235- ( Temperature sender upstream turbocharger -G507- )
- 9 - The unit injectors
  - ☐ Unit injector solenoid valve cyl. 1 -N240-
  - ☐ Unit injector solenoid valve cyl. 2 -N241-
  - ☐ Unit injector solenoid valve cyl. 3 -N242-
  - ☐ Unit injector solenoid valve cyl. 4 -N243-
  - ☐ Removing and installing unit injectors ⇒ [page 178](#)
- 10 - Changeover valve for radiator of exhaust gas recirculation -N345-
- 11 - Coolant temperature sender -G62-
- 12 - Solenoid valve for charge pressure control -N75-
- 13 - Plug connection
  - ☐ on the left partition panel
  - ☐ Summary of components ⇒ [page 171](#)
- 14 - Air mass meter -G70-
- 15 - Tandem pump
- 16 - Multipin plug connection
  - ☐ central for pump-nozzle units
- 17 - Engine speed sender -G28-
  - ☐ removing and installing ⇒ [page 181](#)
- 18 - Fuel temperature sender -G81-
- 19 - Glow plugs
  - ☐ Glow plug 3 - Q12-
  - ☐ Glow plug 4 - Q13-
  - ☐ Removing and installing glow plugs ⇒ [page 204](#)
- 20 - 3-pin connector  
for hall sender -G40-
- 21 - Coolant temperature sender at radiator outlet -G83-
- 22 - Glow plugs
  - ☐ Glow plug 1 - Q10-
  - ☐ Glow plug 2 - Q11-
  - ☐ Removing and installing glow plugs ⇒ [page 204](#)
- 23 - Charge pressure sender -G31- with intake air temperature sender -G42-
- 24 - Hall sender -G40-
  - ☐ for camshaft position

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

### Overview - connector on the partition panel

- 1 - Solenoid valve for charge pressure control -N75-
- 2 - Connector (orange) for temperature sender downstream particle filter -G527-
- 3 - Connector for temperature sender upstream particle filter - G506-
- 4 - Connector for lambda probe -G39- and heating for lambda probe -Z19-
- 5 - Connector for temperature sender upstream turbocharger - G507-



## 1.2 Intake manifold - Summary of components

### 1.2.1 Summary of components for engine with identification characters BJB

The intake manifold flap closes for about 3 seconds after switching off the engine and then opens again. This reduces the switch-off impact.

ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

**1 - Intake manifold**

**2 - O-ring**

- ☐ replace

**3 - Air intake pipe**

- ☐ with mechanical exhaust gas recirculation valve and intake manifold flap

**4 - 10 Nm**

**5 - Gasket**

- ☐ replace

**6 - Connecting tube**

- ☐ from exhaust manifold

**7 - 10 Nm**

**8 - Support**

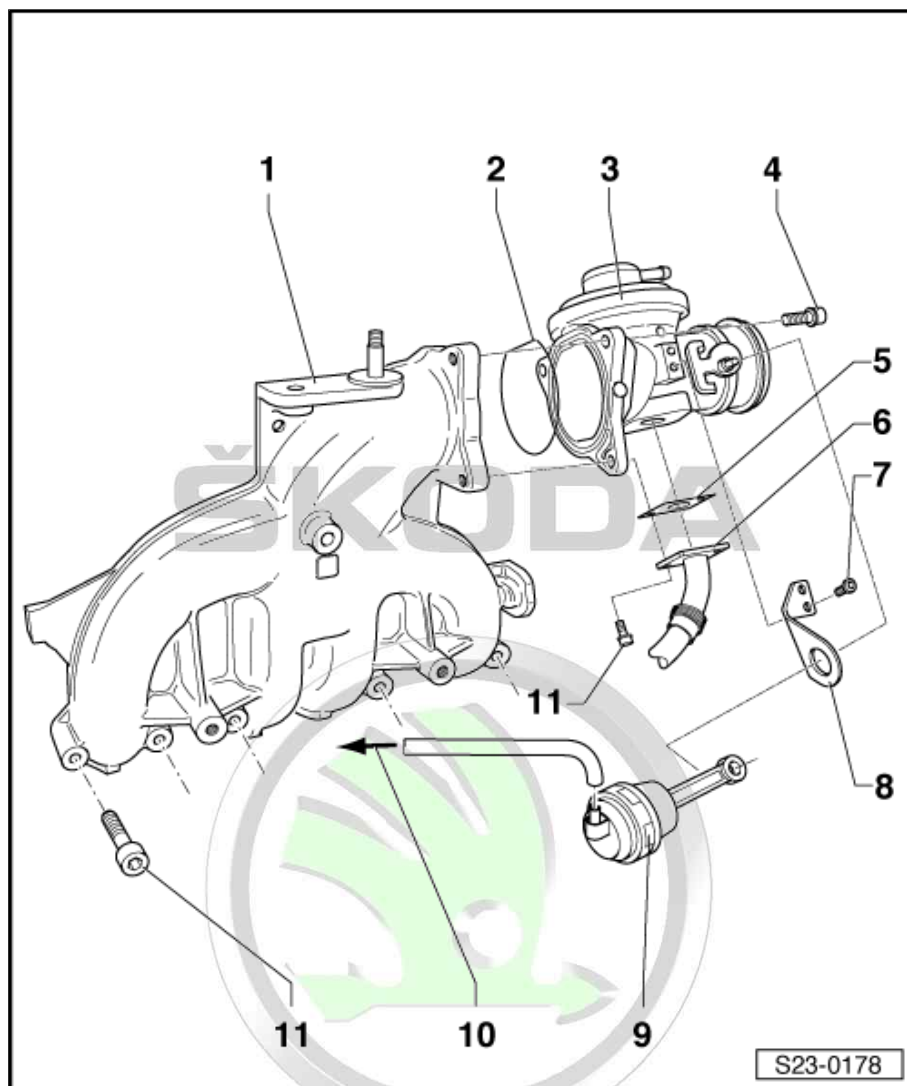
**9 - Vacuum setting element**

- ☐ for intake manifold flap

**10 - to valve block**

- ☐ Outlet of the change-over valve for intake manifold flap -N239-

**11 - 22 Nm**



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

## 1.2.2 Summary of components for engine with identification characters BKC, BXE

1 - Intake manifold

2 - O-ring

☐ replace

3 - Air intake pipe

☐ with mechanical ex-  
haust gas recirculation  
valve

4 - 10 Nm

5 - Intake manifold flap motor -  
V 157-

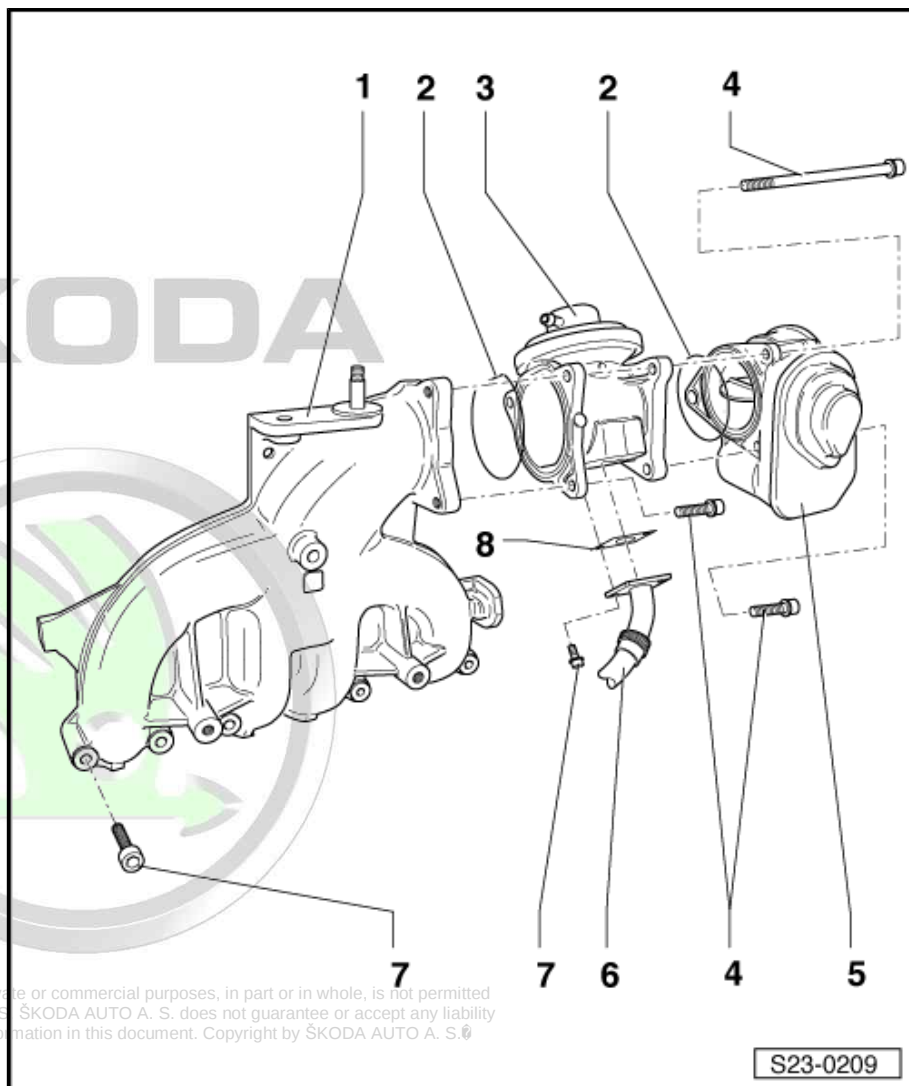
6 - Connecting tube

☐ from the flap of the ex-  
haust gas recirculation  
radiator

7 - 22 Nm

8 - Gasket

☐ replace





### 1.2.3 Summary of components for engine with identification characters BLS



#### Note

- ♦ The actuation of the exhaust gas recirculation system is performed by the engine control unit -J248- for the EGR valve -N18- with EGR potentiometer -G212- and EGR control motor -V338-.
- ♦ The mechanical exhaust gas recirculation valve with cone-shaped valve plunger makes it possible to achieve different opening cross-sections at different valve strokes.
- ♦ Always replace self-locking nuts.

#### 1 - Gasket

- ☐ replace

#### 2 - Intake manifold

#### 3 - Gasket ring

- ☐ replace

#### 4 - Supports

#### 5 - Intake manifold flap motor - V157-

#### 6 - from charge-air cooler

#### 7 - 10 Nm

#### 8 - Exhaust gas recirculation valve -N18- with EGR potentiometer -G212- and EGR control motor -V338-

#### 9 - Gasket

- ☐ replace

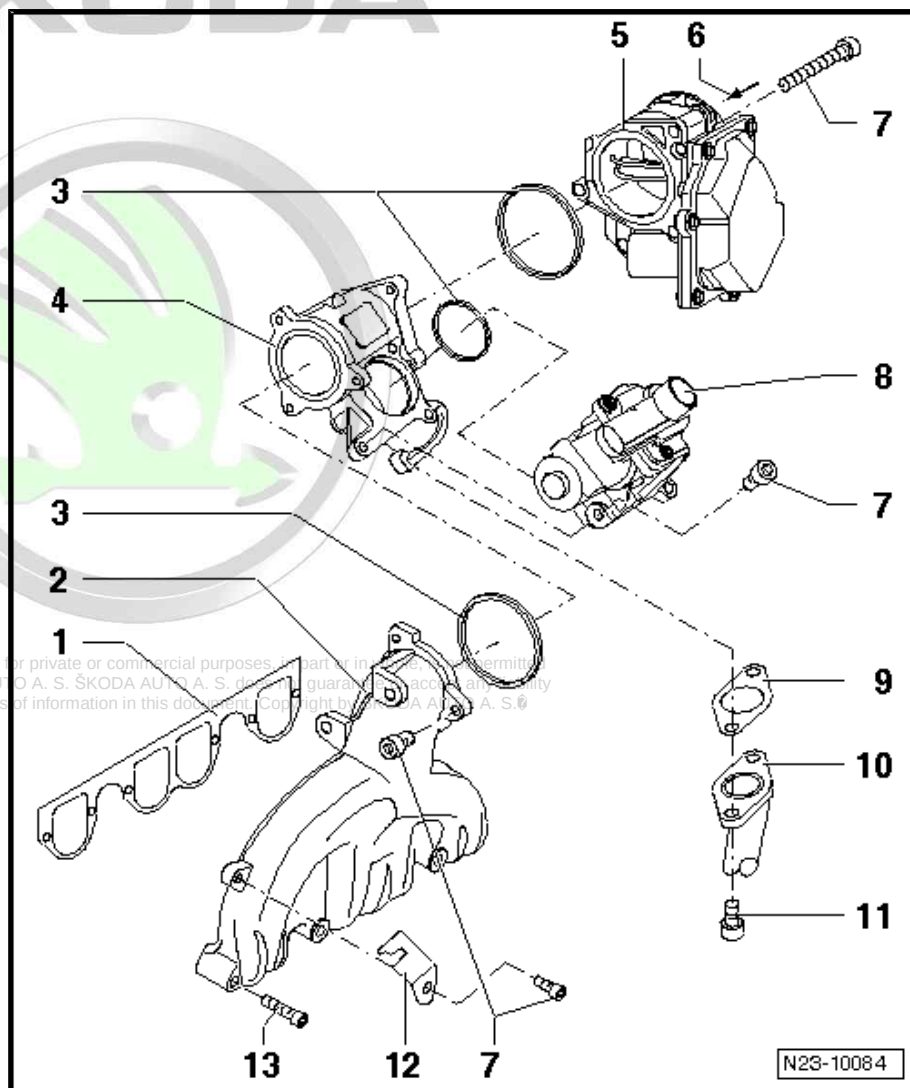
#### 10 - Radiator

- ☐ for exhaust gas recirculation

#### 11 - 22 Nm

#### 12 - Support

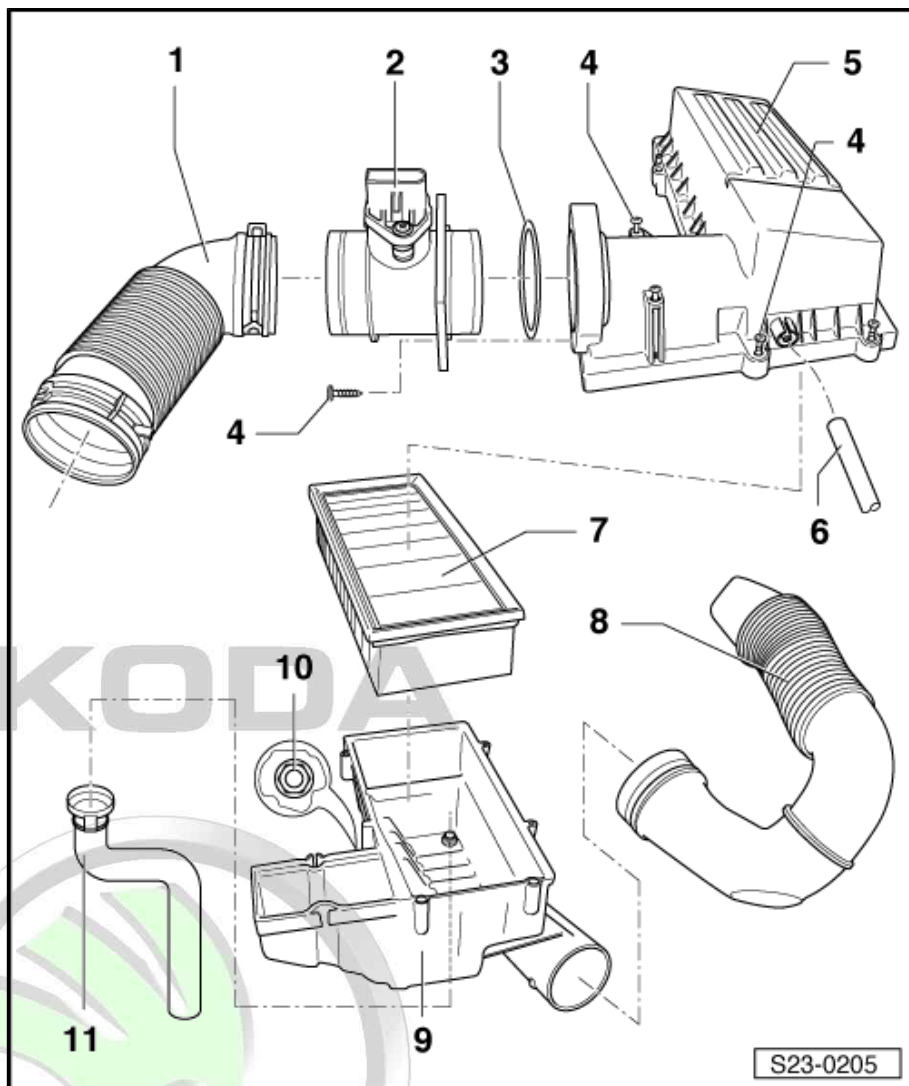
#### 13 - 22 Nm





## 1.3 Removing and installing air filter

- 1 - Air intake hose**
  - ☐ to turbocharger
- 2 - Air mass meter -G70-**
- 3 - O-ring**
  - ☐ replace if damaged
- 4 - 2 Nm**
- 5 - Air filter top part**
  - ☐ if during repairs the air filter housing is opened (except for air filter element change), it should be entered in the Service Schedule (change interval for air filter element is shortened)
- 6 - Ventilation hose**
  - ☐ of valve block
- 7 - Filter insert**
- 8 - Air deflector**
  - ☐ from lock carrier
- 9 - Air filter bottom part**
  - ☐ with supports for drain pipe
- 10 - 8 Nm**
- 11 - Drain pipe**
  - ☐ Vehicles 12.04 ?



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

## 1.4 Repairing the unit injectors

1 - 20 Nm + torque a further  $\frac{1}{4}$  turn (90 °)

- ☐ replace

2 - Valve-lever shaft

- ☐ with valve levers

3 - Counternut, 30 Nm

4 - Adjusting screw

- ☐ replace when installing a new unit injector and where wear marks are visible
- ☐ Grease the contact surface of the unit injector to the ball pin using grease -G 000 100-

5 - Ball pin

- ☐ replace

6 - The unit injector

- ☐ Check ball pins for wear marks and replace if necessary
- ☐ Grease the contact surface to the adjusting screw using grease -G 000 100-
- ☐ removing and installing  
⇒ [page 178](#)

7 - O-ring

- ☐ replace ⇒ [page 176](#)

8 - O-ring

- ☐ replace ⇒ [page 176](#)

9 - O-ring

- ☐ replace ⇒ [page 176](#)

10 - Heat-protection seal

- ☐ replace

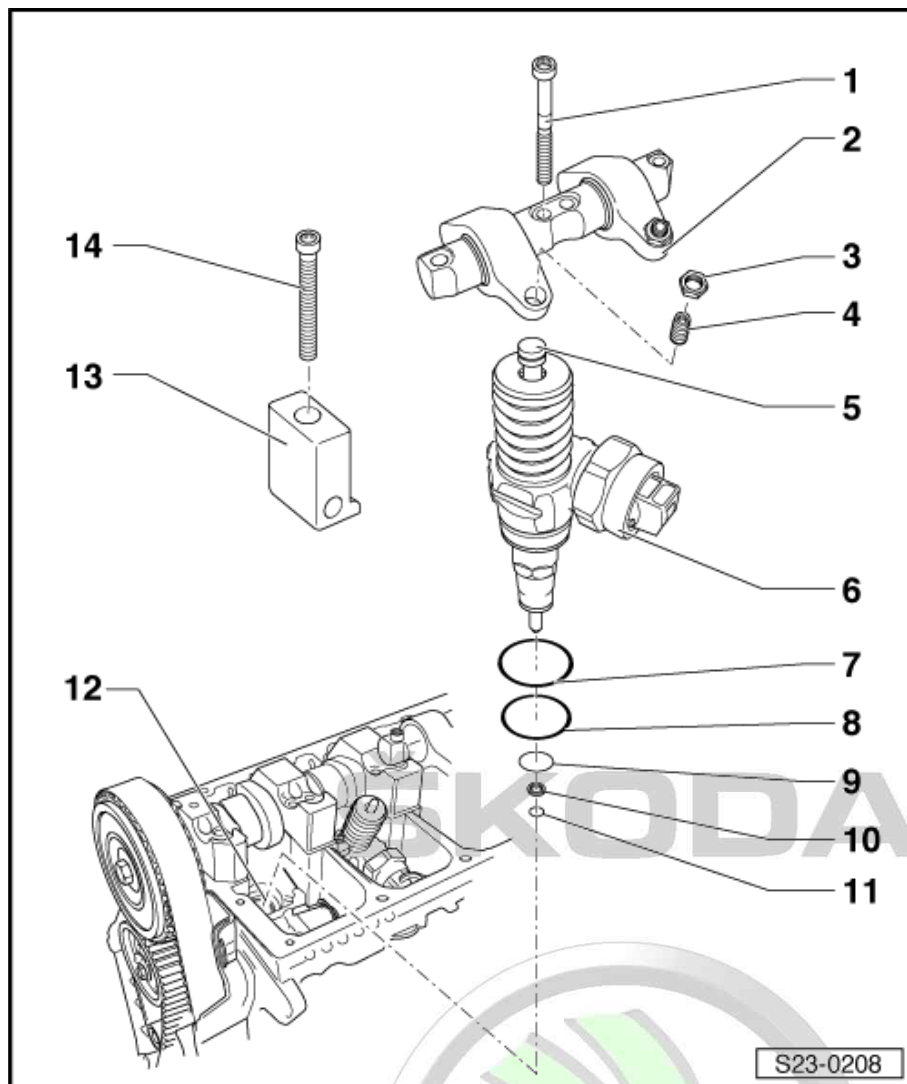
11 - Circlip

12 - Cylinder head

13 - Clamping pad

14 - 12 Nm + torque a further  $\frac{3}{4}$  turn (270 °)

- ☐ replace



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 1.5 Removing and installing O-rings for unit injector

Special tools and workshop equipment required

- ◆ Assembling sleeves -T10056-

## Removing

- Lever off the O-rings from the grooves of the unit injector with extreme care.
- Make sure that no burr arises at the base of the O-rings.

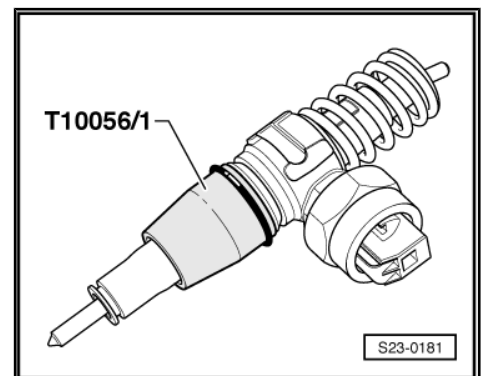
## Install



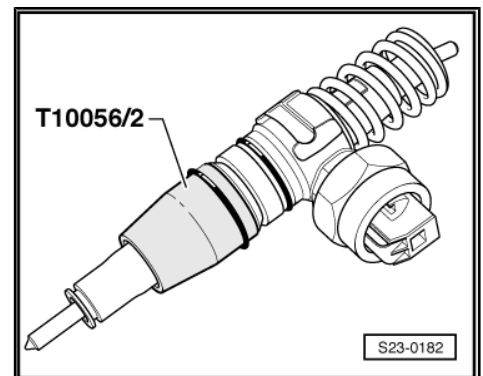
### Note

- ◆ *Always use the assembly sleeves to install the O-rings. If they are not used there is a risk that the O-rings may become damaged.*
- ◆ *Observe the correct allocation of the O-rings to the channels: the ring thickness reduces in the direction of the injection nozzle.*
- ◆ *Avoid rolling the O-rings when sliding them on. The O-rings must not be turned inwards on the seat of the unit injector.*

- Remove the heat-protection seal along with the circlip.
- Clean the seating surfaces for the O-rings in the grooves of the unit injector with great care.
- Insert the assembly sleeve -T10056/1- on the unit injector up to the stop.
- Carefully slide the upper, thicker O-ring onto the assembly sleeve and in the groove of the unit injector.
- Remove assembly sleeve.

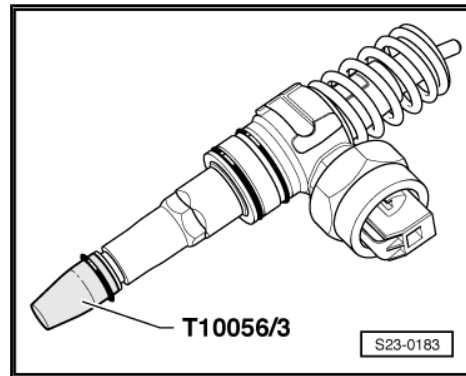


- Insert the assembly sleeve -T10056/2- on the unit injector up to the stop.
- Carefully slide the middle, thinner O-ring onto the assembly sleeve and in the groove of the unit injector.
- Remove assembly sleeve.



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the use of the information contained in this manual for ŠKODA AUTO A. S.

- Insert the assembly sleeve -T10056/3- on the unit injector up to the stop.
- Carefully slide the lower O-ring onto the assembly sleeve and in the groove of the unit injector.
- Remove assembly sleeve.
- Slide on a new heat-protection seal together with the circlip.



## 1.6 Removing and installing the unit injector

### Special tools and workshop equipment required

- ♦ Extractor -T10055-
- ♦ Universal dial gauge holder -MP3-447 (VW 387)-
- ♦ Dial gauge

### 1.6.1 Removing

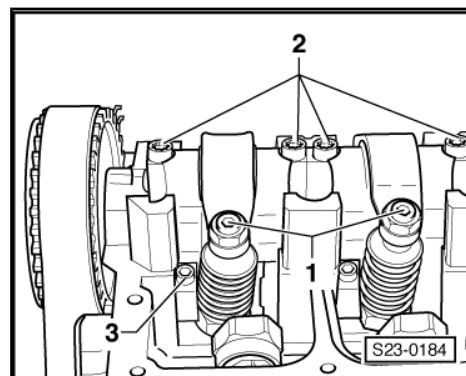
- Remove top toothed belt guard and cylinder head cover  
⇒ [page 59](#).



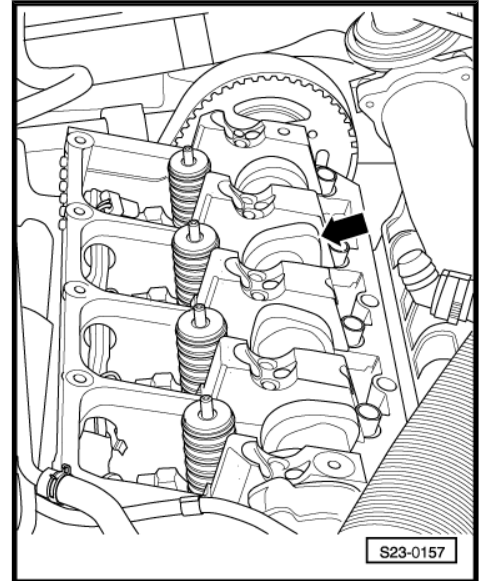
#### Note

*Turn engine at hexagonal of central screw at front end of the crankshaft, if necessary using counterholder -T10172- or using counterholder -MP1-216 (3036)- at camshaft sprocket.*

- Turn the crankshaft until the corresponding cam pair of the relevant unit injector to be removed points uniformly upwards.
- Release the counternuts of the adjusting screws -1- and unscrew the adjusting screws until the valve lever rests against the ball pin of the unit injectors.
- Screw out fixing screws -2- for the valve-lever shaft from the outside to the inside and remove the valve-lever shaft.



- Set the camshaft in such a way that the cam for Cylinder 2 points in -direction of arrow-. All clamping pads can be removed in this position.
- Unplug the connector from the unit injector. Support the opposite side of the connector with your finger in order to avoid twisting the connector.
- Screw out fixing screw -3- of the clamping pad and remove the pad in the direction towards the camshaft.

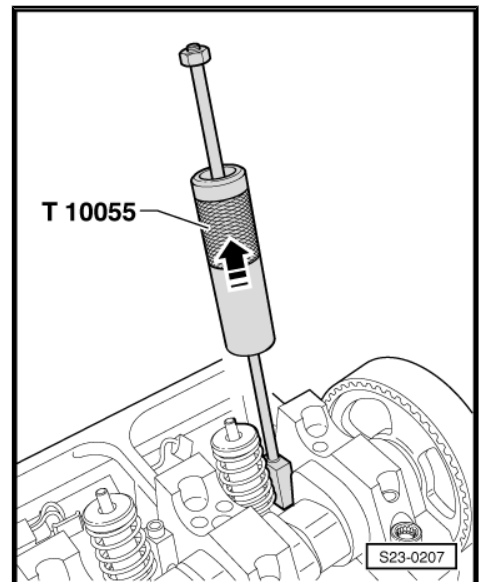


- Insert extractor - T10055- in direction of the camshaft instead of the clamping pad in the slot of the unit injector.
- Remove the unit injector through movements of the sleeve at the nut up to the stop in -direction of arrow-.



#### Note

*Do not interchange the unit injectors, if necessary mark the assignment to each cylinder.*



## 1.6.2 Install



#### Note

- ◆ *For any work procedure involving an adjustment of the unit injector it is necessary to clean the adjusting screw in the valve lever and also the ball pin of the unit injector and to check them for traces of wear. If there is any wear replace the ball pin and the adjusting screw.*
- ◆ *Grease the contact surfaces between the ball pin and the adjusting screw using grease -G 000 100- .*
- ◆ *New unit injectors are supplied with O-rings and heat-protection seal.*
- ◆ *If the old unit injectors are installed again, all O-rings and the heat-protection seal must be replaced.*
- Before installing the unit injector check the correct position of all three O-rings, heat-protection seal and the circlip.





## Note

*The O-rings must not be twisted.*

- Oil the O-rings and place the unit injector with the greatest of care into the cylinder head.
- Slide unit injector into the cylinder head seat up to the stop by exerting a uniform pressure.
- Place the clamping pad in the side slot of the unit injector.



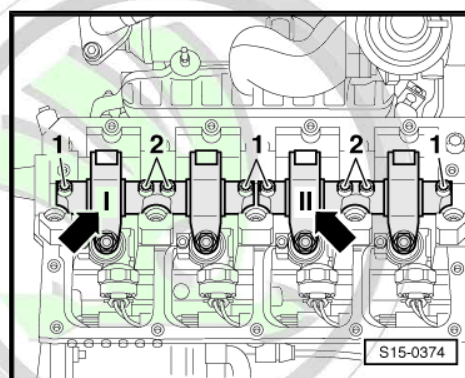
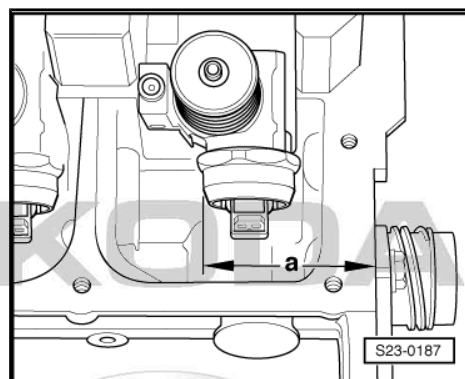
## Note

*If the unit injector is not perpendicular to the clamping pad the fixing screw may loosen and cause damage to the unit injector or cylinder head.*

- Align the unit injector as follows:
- Screw the new fixing screw in the clamping pad until the unit injector can still easily be turned.
- Set unit injector at a right angle to the bearing shell of the camshaft.
- Using a caliper gauge, check dimension -a- from the outer side of the cylinder head to the cylinder surface of the unit injector.

| Cylinder | Dimension -a-  |
|----------|----------------|
| 1        | 333,0 ± 0.8 mm |
| 2        | 245,0 ± 0.8 mm |
| 3        | 153,6 ± 0.8 mm |
| 4        | 65,6 ± 0.8 mm  |

- Adjust the unit injector as required, tighten the fixing screw using a torque of 12 Nm and then turn through a further 270° (3/4 turn). Tightening may occur in successive stages.
- Mount valve-lever shaft and tighten up the new fixing screws as follows:
- First tighten the inside -2- then both outside -1- screws by hand. In the same sequence tighten to 20 Nm and turn a further 90° (1/4 turn).

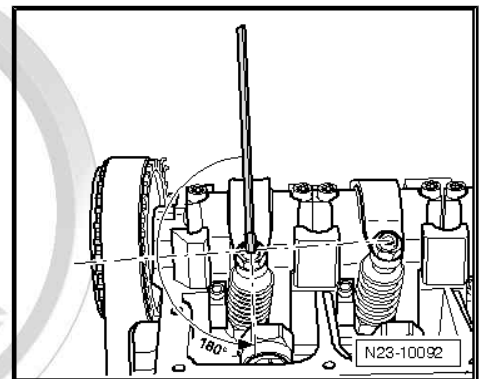
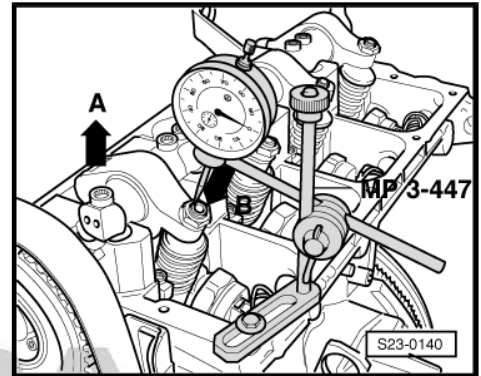


- Place a dial gauge on the adjusting screw of the unit injector.

**i Note**

*Turn engine at hexagonal of central screw at front end of the crankshaft, if necessary using counterholder -T10172- or using counterholder -MP1-216 (3036)- at camshaft sprocket.*

- Turn the crankshaft in the running direction of the engine until the roller of the valve lever is on the drive cam tip.
- ♦ Roller side -arrow A- is on the highest point.
- ♦ Dial gauge -arrow B- is on the lowest point.
- Remove the dial gauge.
- Turn the adjusting screw in the valve lever until one feels a significant resistance (the unit injector is against the stop).
- Turn the adjusting screw in the opposite direction from the stop by about 180°
- Hold the adjusting screw in this position and tighten up the lock nut using a torque of 30 Nm
- Place connector onto the unit injector and install the cylinder head cover and the top timing belt cover.



## 1.7 Removing and installing engine speed sender -G28-

### Special tools and workshop equipment required

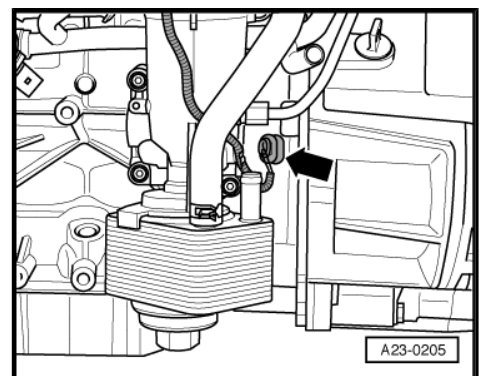
- ♦ Hose clamps up to Ø 25 mm -MP7-602 (3094) -
- ♦ Assembly device -T10118-

### Removing

- Remove noise insulation ⇒ Body Work ⇒ Rep. Gr. 50 .
- Unclip the coolant hoses at the oil cooler with hose clamps and remove the coolant hoses.
- Remove oil filter holder ⇒ [page 89](#) .
- Remove the plug -arrow- on the engine speed sender -G28- with the assembly device -T10118- and lay the electrical cable to the side.

**i Note**

*To unlock the plug without using the assembly device -T10118-, the unlock button must be pressed at the plug using the screwdriver and at the same time raise the unlock button with a thin wire hook.*





- Unscrew the fixing screw -2- for the engine speed sender - G28- -1-.

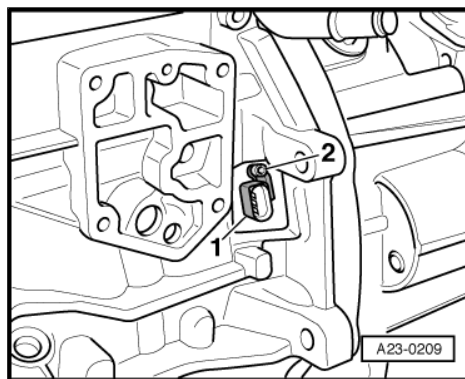
### Install

Installation is performed in the reverse order, pay attention to the following points:

- Install oil filter holder ⇒ [page 89](#) .

### Tightening torque

| Component                               | Nm |
|-----------------------------------------|----|
| Engine speed sender -G28- on the flange | 5  |



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

## 2 Engine control unit

### 2.1 Removing and installing engine control unit



#### Note

*In order to be able to unplug the connector from the control unit, the control unit must always be removed.*

#### Special tools and workshop equipment required

- ◆ Body saw e.g. -V.A.G 1523/A-



#### Note

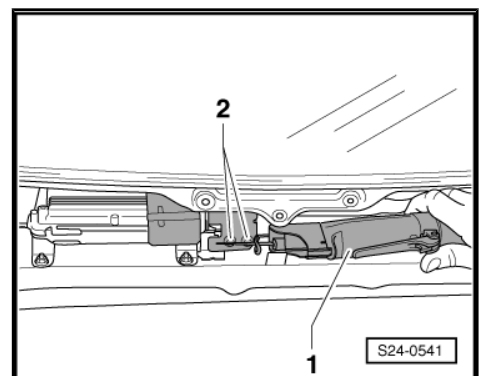
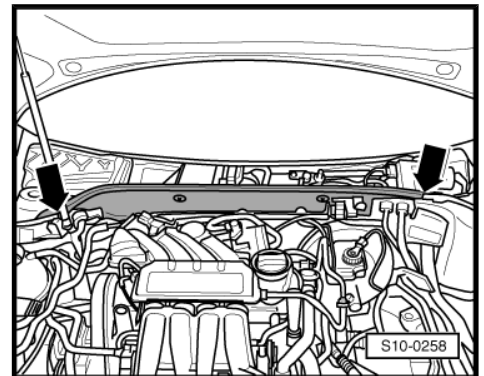
*If the engine control unit must be replaced, the ⇒ Vehicle diagnosis, testing and information system VAS 5051 must be connected and the function "replace engine control unit" must be performed.*

#### Removing

- When replacing the engine control unit, in the "guided fault detection system" the diagnostic field "replace engine control unit" must be selected ⇒ Vehicle diagnosis, testing and information system VAS 5051.
- Switch off ignition.
- Remove the cooling water tank cover ⇒ Body Work ⇒ Rep. Gr. 66 .
- Remove the intermediate wall for cooling water tank -arrows-.
- Remove windscreen wiper and washer system ⇒ Electrical System ⇒ Rep. Gr. 92 .

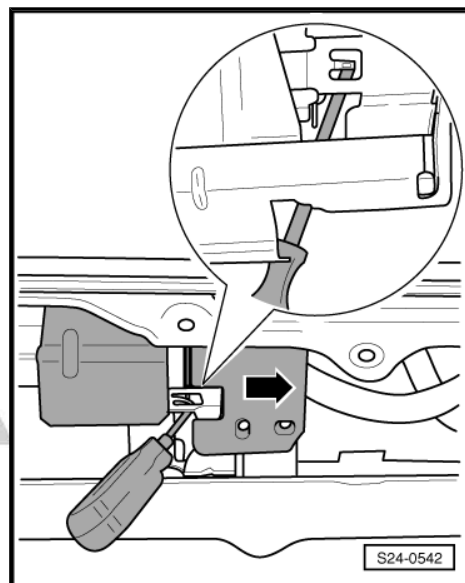
#### For vehicles with protective cover

- Cut with body saw -1- a slot for the cross-head screwdriver in the heads of the pull-off screws -2-.
- Screw out the screws.



- Lift locking tab of protective cover with cross-head screwdriver.
- Push the protective cover in the -direction of the arrow- out of the bracket for engine control unit.

#### For all vehicles



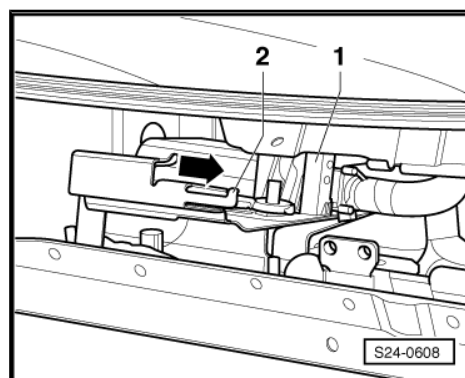
- Unlock retaining bracket -2-.
  - Push out engine control unit with connectors in the -direction of the arrow-.
- Unlock connector at engine control unit and unplug.

#### Install



#### Note

*For vehicles with protective cover, the metal swarfs must be suctioned out of the plenum chamber before installing the engine control unit.*



- Connect both connectors and lock.
- Push engine control unit into the bracket and lock with retaining bracket -2-.

#### For vehicles with protective cover

- Fasten protective cover with new pull-off screws (before tightening align the protective cover in such a way that it does not come into contact with the surrounding components)

#### For all vehicles

- Install windscreen wiper and washer system ⇒ Electrical System ⇒ Rep. Gr. 92 .
- Install the intermediate wall and cooling water tank cover ⇒ Body Work ⇒ Rep. Gr. 66 .



## 26 – Exhaust System

### 1 Removing and installing parts of the exhaust system

#### Note

- ◆ The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - danger of damaging it.
- ◆ Replace the gaskets and the self-locking nuts.
- ◆ After performing installation work on the exhaust system, make sure the exhaust system is not mounted under tension and has adequate clearance from the vehicle body. If necessary slacken the double clamp and align the silencer and exhaust pipe so as to create adequate clearance between these components and the vehicle body, and that the weight of the exhaust system is evenly distributed over the hangers.

#### 1.1 Summary of components for engine with identification characters BJB, BKC, BXE with front-wheel drive

##### 1 - Rear tunnel bridge

##### 2 - The middle silencer

- ☐ for first version building unit with rear silencer, replace individually when carrying out repairs
- ☐ Separation point  
⇒ [page 194](#)
- ☐ Align exhaust system free of stress  
⇒ [page 195](#)

##### 3 - Retaining strap

- ☐ replace if damaged
- ☐ pay attention to the spare part number

##### 4 - Hanger

5 - 20 Nm

6 - 23 Nm

##### 7 - Fixing clamp - 7 Nm

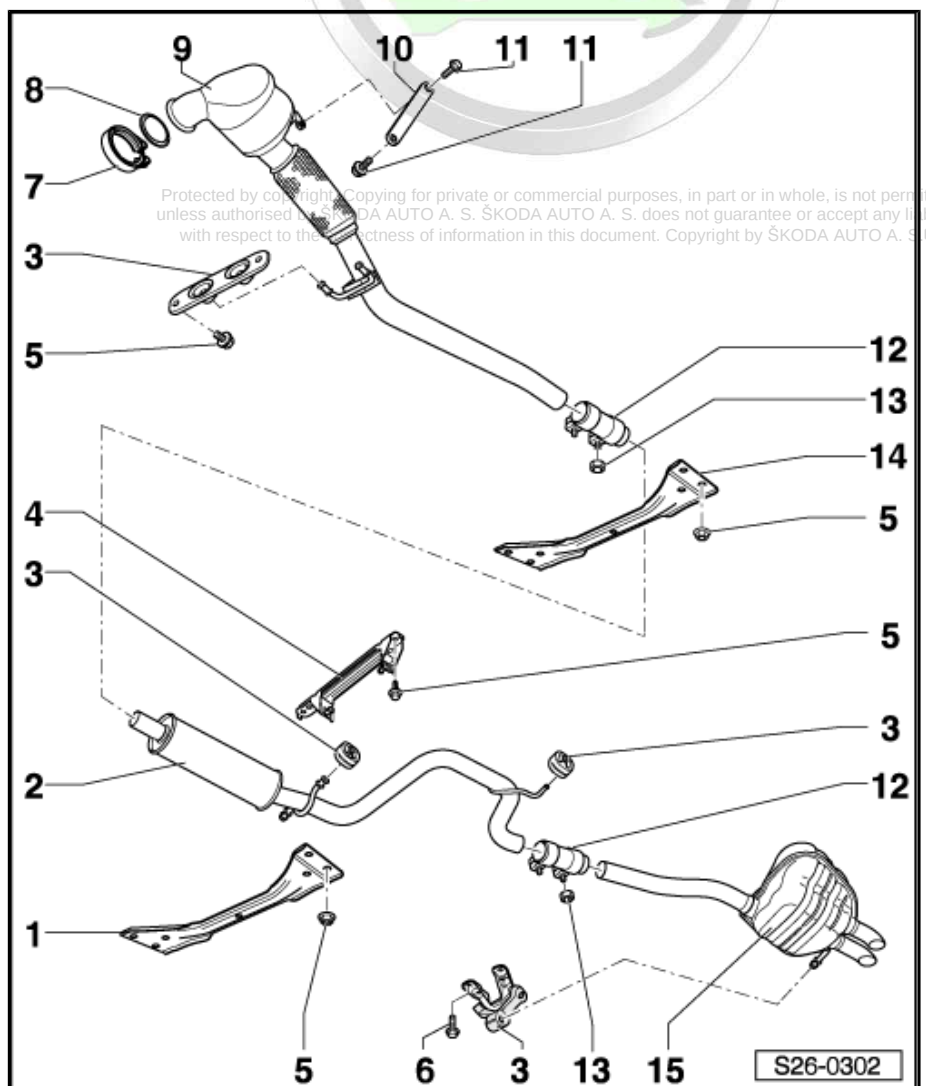
- ☐ replace

##### 8 - Gasket

- ☐ replace
- ☐ Check fitting position

##### 9 - Front exhaust pipe

- ☐ with catalytic converter
- ☐ protect against shocks and blows
- ☐ with decoupling element
- ☐ do not twist decoupling



element more than 10° - risk of damage

- ☐ Align exhaust system free of stress ⇒ [page 195](#)

## 10 - Support

11 - 40 Nm

## 12 - Double clamp

- ☐ align exhaust system free of stress before tightening ⇒ [page 195](#)
- ☐ Tighten bolted connections evenly

13 - 23 Nm

## 14 - Front tunnel bridge

## 15 - Rear silencer

- ☐ for first version building unit with middle silencer, replace individually when carrying out repairs
- ☐ Separation point ⇒ [page 194](#)
- ☐ Align exhaust system free of stress ⇒ [page 195](#)

## 1.2 Summary of components for engine with identification characters BLS with front-wheel drive

1 - Pressure sensor 1 for exhaust gas -G450-

2 - Support

- ☐ for pressure line

3 - Pressure line - 45 Nm

4 - 10 Nm

5 - Lambda probe -G39- - 50 Nm

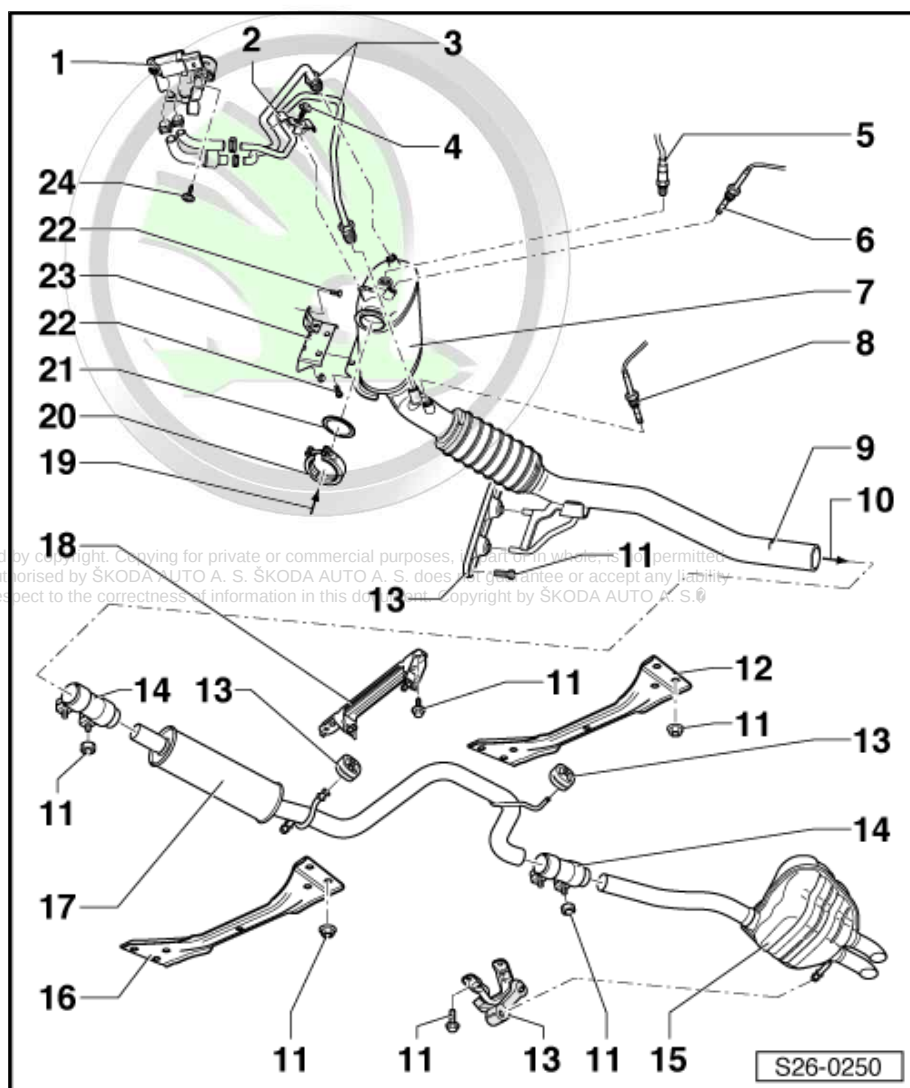
- ☐ the thread of new lambda probes must be coated with assembly paste
- ☐ for re-used lambda probe, only coat the thread with hot bolt paste - G 052 112 A3- ; the hot bolt paste -G 052 112 A3- must not get into the slots of the probe body

6 - Exhaust gas temperature sender 2 -G448- ( Temperature sender upstream particle filter -G506- )

- ☐ 45 Nm
- ☐ coat only the thread with hot bolt paste -G 052 112 A3-

7 - Front exhaust pipe with diesel particle filter

- ☐ removing and installing ⇒ [page 191](#)





**8 - Exhaust gas temperature sender 3 -G495- ( Temperature sender downstream particle filter -G527- )**

- ☐ 45 Nm
- ☐ coat only the thread with hot bolt paste -G 052 112 A3-

**9 - Identification**

- ☐ for double clamp

**10 - to the central silencer**

**11 - 20 Nm**

**12 - Front tunnel bridge**

**13 - Retaining strap**

- ☐ replace if damaged
- ☐ pay attention to Part No.

**14 - Double clamp**

- ☐ align exhaust system free of stress before tightening ⇒ [page 195](#)
- ☐ Tighten bolted connections evenly

**15 - Rear silencer**

- ☐ for first version building unit with middle silencer, replace individually when carrying out repairs
- ☐ Separation point ⇒ [page 194](#)
- ☐ Align exhaust system free of stress ⇒ [page 195](#)

**16 - Rear tunnel bridge**

**17 - The middle silencer**

- ☐ for first version building unit with rear silencer, replace individually when carrying out repairs
- ☐ Separation point ⇒ [page 194](#)
- ☐ Align exhaust system free of stress ⇒ [page 195](#)

**18 - Hanger**

**19 - from exhaust turbocharger**

**20 - Clamp - 7 Nm**

- ☐ replace

**21 - Gasket**

- ☐ replace
- ☐ Check fitting position

**22 - 25 Nm**

**23 - Support**

- ☐ screwed onto the cylinder head cover

**24 - 8 Nm**

ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

### 1.3 Summary of components for engine with identification characters BKC, BXE for four-wheel drive vehicles

#### 1 - Front exhaust pipe

- ☐ with catalytic converter
- ☐ protect against shocks and blows
- ☐ with decoupling element
- ☐ do not twist decoupling element more than 10° - risk of damage
- ☐ removing and installing  
⇒ [page 190](#)
- ☐ Align exhaust system free of stress  
⇒ [page 195](#)

#### 2 - Retaining strap

- ☐ replace if damaged
- ☐ pay attention to the spare part number

#### 3 - 20 Nm

#### 4 - 23 Nm

#### 5 - Double clamp

- ☐ align exhaust system free of stress before tightening ⇒ [page 195](#)
- ☐ Tighten bolted connections evenly

#### 6 - 23 Nm

#### 7 - Front tunnel bridge

#### 8 - Middle and rear silencer

- ☐ replace complete when carrying out repairs
- ☐ Align exhaust system free of stress  
⇒ [page 195](#)

#### 9 - Rear tunnel bridge

#### 10 - Hanger

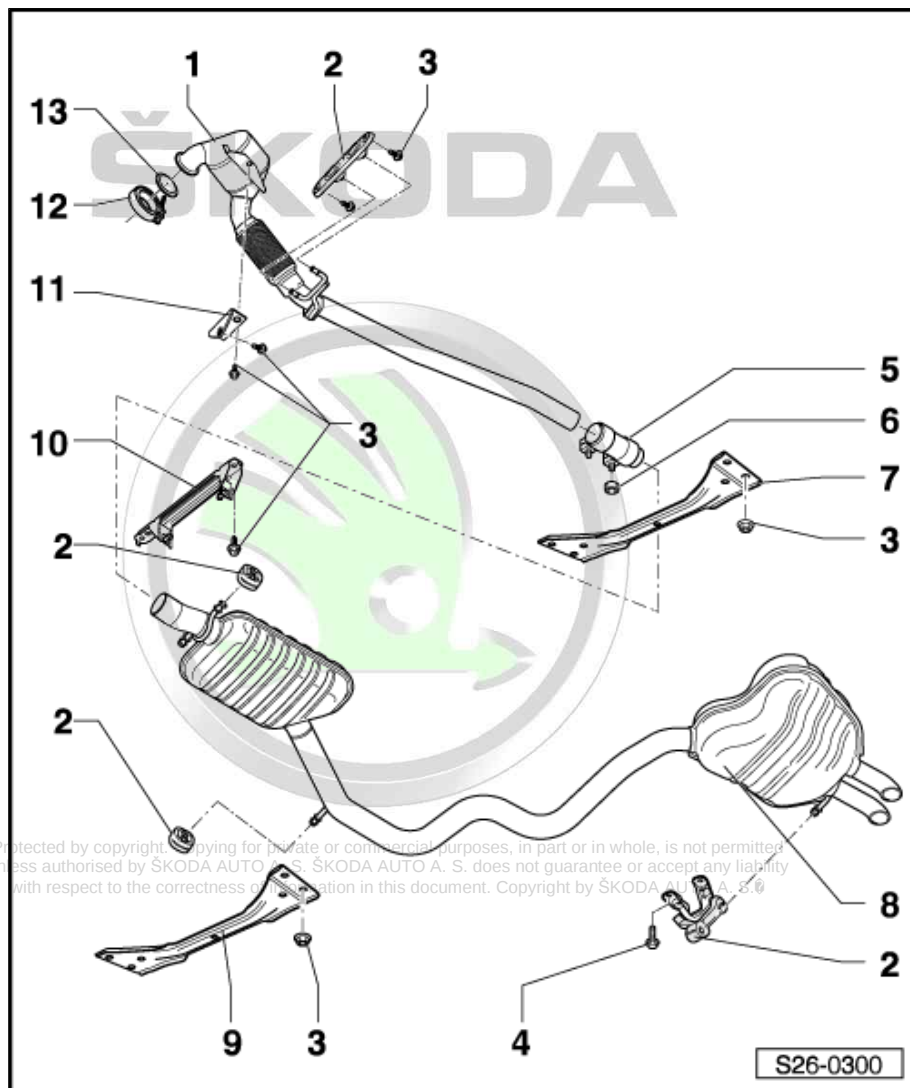
#### 11 - Support

#### 12 - Fixing clamp - 7 Nm

- ☐ replace

#### 13 - Gasket

- ☐ replace
- ☐ Check fitting position



## 1.4 Summary of components for engine with identification characters BLS for four-wheel drive vehicles

**1 - Pressure sensor 1 for exhaust gas -G450-**

**2 - Support**

- ☐ for pressure line

**3 - Pressure line - 45 Nm**

**4 - 10 Nm**

**5 - Lambda probe -G39- - 50 Nm**

- ☐ the thread of new lambda probes must be coated with assembly paste
- ☐ for re-used lambda probe, only coat the thread with hot bolt paste - G 052 112 A3- ; the hot bolt paste -G 052 112 A3- must not get into the slots of the probe body

**6 - Exhaust gas temperature sender 2 -G448- ( Temperature sender upstream particle filter -G506- )**

- ☐ 45 Nm
- ☐ coat only the thread with hot bolt paste -G 052 112 A3-

**7 - Front exhaust pipe with diesel particle filter**

- ☐ removing and installing [⇒ page 191](#)

**8 - Identification**

- ☐ for double clamp

**9 - Double clamp**

- ☐ align exhaust system free of stress before tightening [⇒ page 195](#)
- ☐ Tighten bolted connections evenly

**10 - 20 Nm**

**11 - 23 Nm**

**12 - Front tunnel bridge**

**13 - Retaining strap**

- ☐ replace if damaged
- ☐ pay attention to Part No.

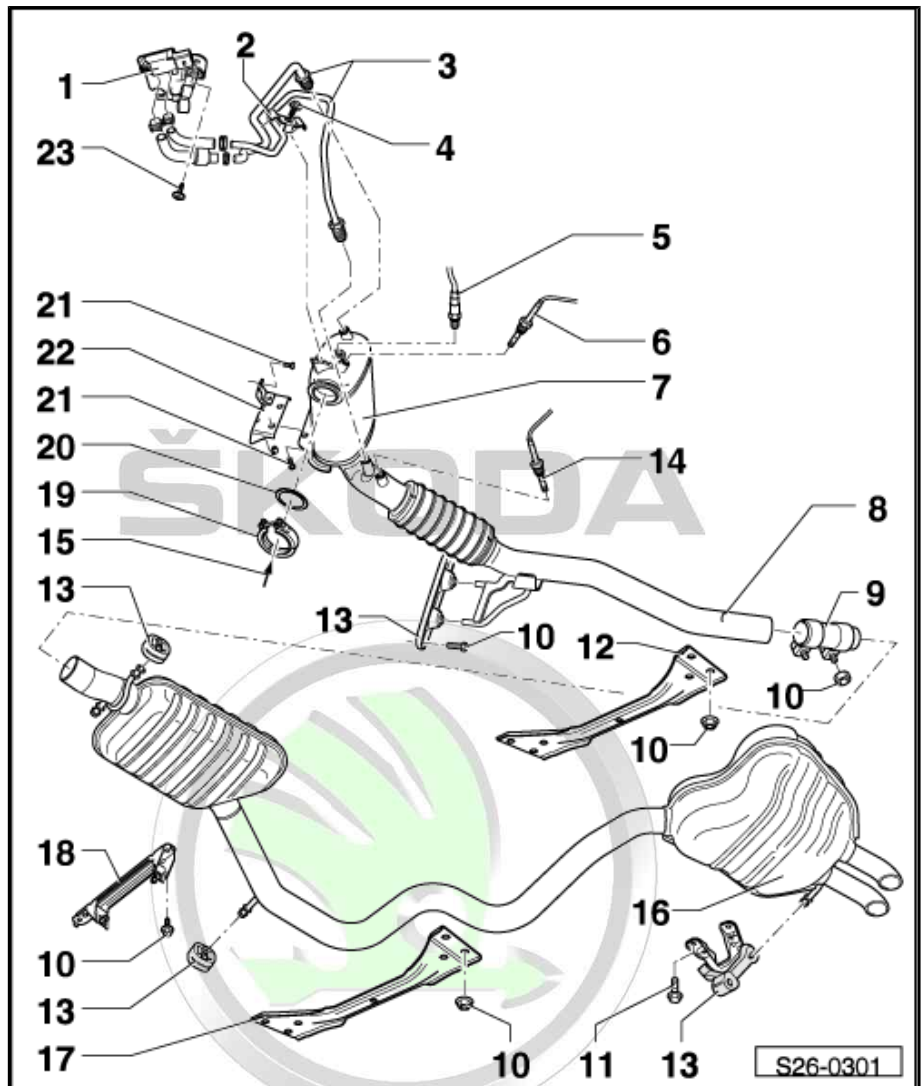
**14 - Exhaust gas temperature sender 3 -G495- ( Temperature sender downstream particle filter -G527- )**

- ☐ 45 Nm
- ☐ coat only the thread with hot bolt paste -G 052 112 A3-

**15 - from exhaust turbocharger**

**16 - Rear silencer**

- ☐ replace complete when carrying out repairs







- ☐ Align exhaust system free of stress ⇒ [page 195](#)

#### 17 - Rear tunnel bridge

#### 18 - Hanger

#### 19 - Clamp - 7 Nm

- ☐ replace

#### 20 - Gasket

- ☐ replace  
☐ Check fitting position

#### 21 - 25 Nm

#### 22 - Support

- ☐ screwed onto the cylinder head cover

#### 23 - 8 Nm

## 1.5 Removing and installing front exhaust pipe for four-wheel drive vehicles

### Special tools and workshop equipment required

- ◆ Pliers for spring strap clamps

### Removing

- Remove noise insulation ⇒ Body Work ⇒ Rep. Gr. 50 .
- Unscrew the drive shaft to the right of the gearbox flange.
- Remove drive shaft screening from the engine (if present).
- Remove propshaft ⇒ Gearbox ⇒ Rep. Gr. 39 .



### Note

*The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - danger of damaging it.*

- Remove fixing clamp for exhaust turbocharger with front exhaust pipe.
- Remove support between front exhaust pipe and gearbox.
- Slacken nuts of double clamp ⇒ [Item 5 \(page 188\)](#) .

- Unscrew hanger of exhaust system -arrows-.
- Take off front exhaust pipe.

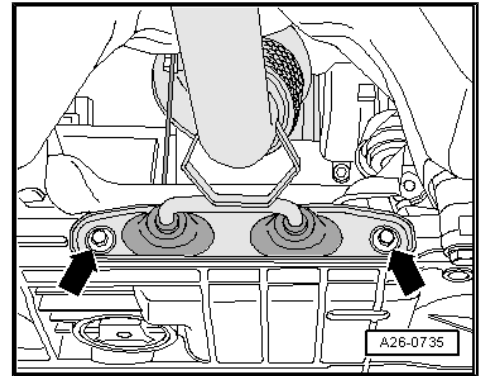
#### Install

- Installation is carried out in the reverse order. Pay attention to the following:



#### Note

- ◆ *Replace the gaskets and the self-locking nuts.*
- ◆ *Secure all hose connections with corresponding hose clips.*
- ◆ *All cable straps which are detached when removing, should be fitted on again in the same place when installing.*
- Observe the assembly instruction for hose connections with push-fit couplings ➔ [page 161](#) .
- Align exhaust system free of stress ➔ [page 195](#) .



## 1.6 Removing and installing front exhaust pipe with diesel particle filter

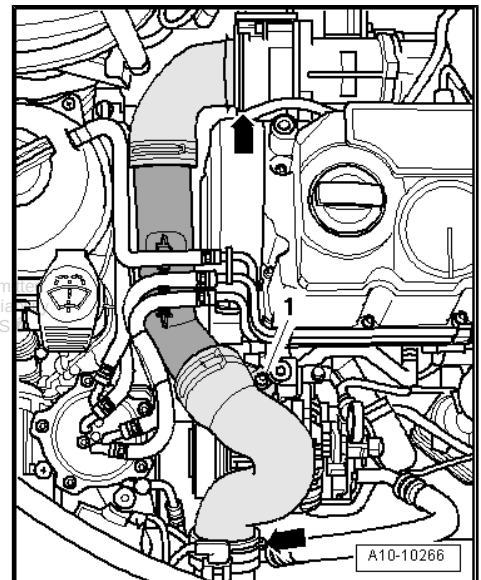
#### Special tools and workshop equipment required

- ◆ Pliers for spring strap clamps
- ◆ Ring spanner set for lambda probe
- ◆ Key set 17 mm -T10395-
- ◆ Hot bolt paste -G 052 112 A3-

#### Removing

- Remove engine cover ➔ [page 7](#) .
- Release fuel hoses and coolant hoses at right air guide pipe.
- Remove right air guide pipe.
- Remove intake manifold flap motor - V157- ➔ [page 171](#) .
- Remove exhaust gas recirculation valve -N18- with EGR potentiometer -G212- and EGR control motor -V338- ➔ [page 197](#) .

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.



- Disconnect electrical contact plug -4- to lambda probe -G39- .

ŠKODA

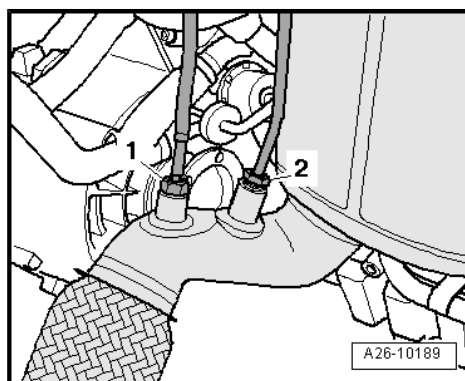
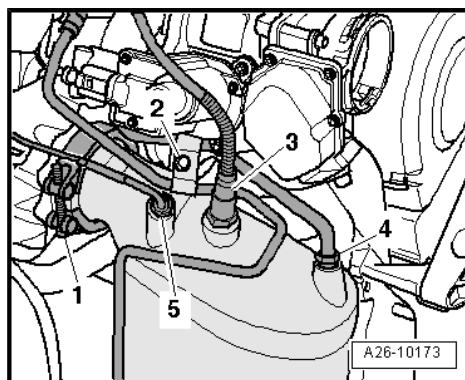
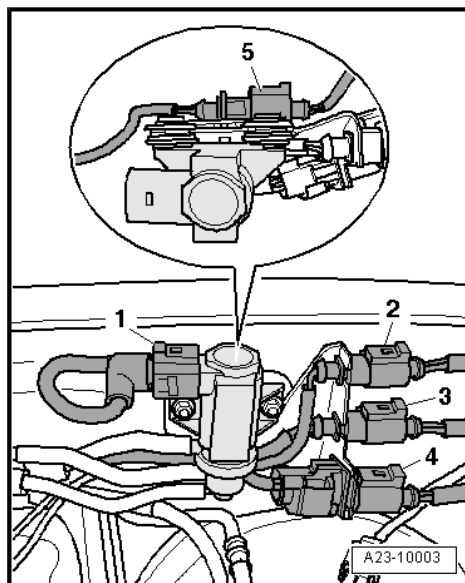
- Unscrew lambda probe -3-.
- Remove exhaust gas temperature sender 2 -G448- ( temperature sender upstream particle filter -G506- ) -5-.
- Unbolt bracket -2- for pressure lines.
- Unbolt pressure line -4- at diesel particle filter.
- Remove fixing clamp -1- for diesel particle filter.
- Remove right front wheel.
- Remove noise insulation ⇒ Body Work ⇒ Rep. Gr. 50 and the complete right cover ⇒ Body Work ⇒ Rep. Gr. 66 .

#### On vehicles with auxiliary heating.

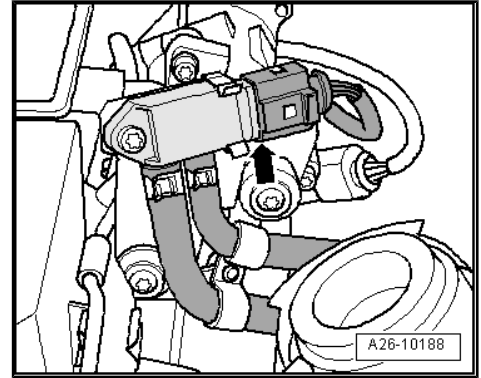
- Remove exhaust pipe from the auxiliary heating (only for vehicles with extended exhaust pipe) ⇒ Heating, Air Conditioning ⇒ Rep. Gr. 82 .

#### For all vehicles

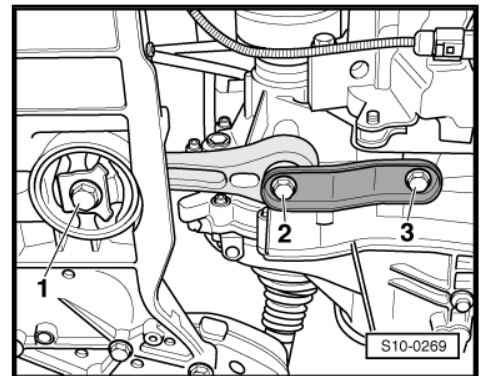
- Disconnect plug from oil level and oil temperature sender - G266- ⇒ [page 87](#) .
- Unscrew exhaust gas temperature sender 3 -G495- ( temperature sender downstream particle filter -G527- ) -1- from exhaust pipe downstream diesel particle filter.
- Unscrew pressure line -2- for exhaust gas pressure sensor 1 -G450- .



- Disconnect plug -arrow- for remove exhaust gas pressure sensor 1 -G450 - with pressure lines.
- Unscrew the drive shaft to the right of the gearbox flange.



- Release screws -1...3- and remove pendulum support.



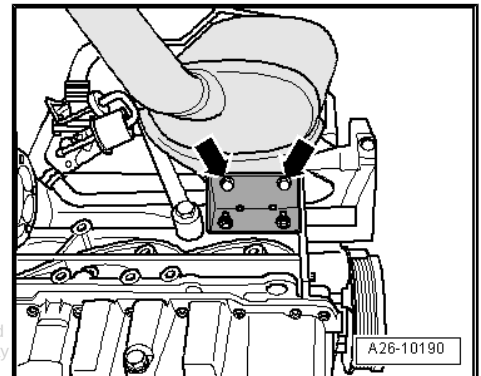
- Unscrew screws -arrows- at bracket for diesel particle filter.
- Remove drive shaft screening from the engine (if present).

#### On four-wheel drive vehicles

- Remove angle gearbox ⇒ Gearbox ⇒ Rep. Gr. 34 .

#### For vehicles with front-wheel drive

- Remove front tunnel bridge ⇒ [Item 12 \(page 187\)](#) .



#### Note

Copyright. Copying for private or commercial purposes, in part or in whole, is not permitted. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. *The decoupling element in the pre-exhaust pipe should not be bent by more than 10° - danger of damaging it.*

- Slacken nuts of double clamp ⇒ [Item 14 \(page 187\)](#) .



- Unscrew hanger of exhaust system -arrows-.

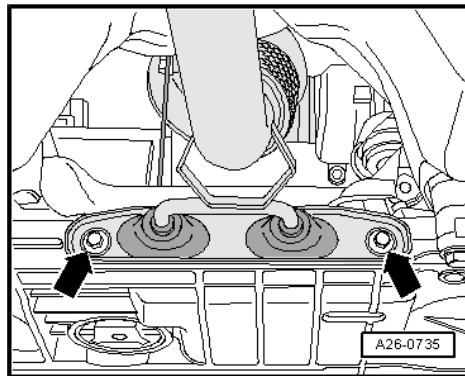
For all vehicles



#### Note

*When removing the diesel particle filter slightly raise the shield, in order to avoid damage.*

- Remove front exhaust pipe with diesel particle filter by turning 180° clockwise, to do so slightly press the engine/gearbox unit forward.



#### Install

- Installation is carried out in the reverse order. Pay attention to the following:



#### Note

- ◆ *Replace the gaskets and the self-locking nuts.*
- ◆ *Secure all hose connections with corresponding hose clips.*
- ◆ *All cable straps which are detached when removing, should be fitted on again in the same place when installing.*
- Observe the assembly instruction for hose connections with push-fit couplings ⇒ [page 161](#) .
- Align exhaust system free of stress ⇒ [page 195](#) .
- After changing the diesel particle filter, an adaption must be performed in the function “Targeted functions” ⇒ Vehicle diagnosis, testing and information system VAS 5051.

## 1.7 Replacing middle or rear silencer

For separating the middle or rear silencer, a separation point is provided in the connecting pipe, which is marked with a recess.

#### Special tools and workshop equipment required

- ◆ Body saw e.g. -V.A.G 1523/A-
- ◆ Protective goggles

#### Procedure

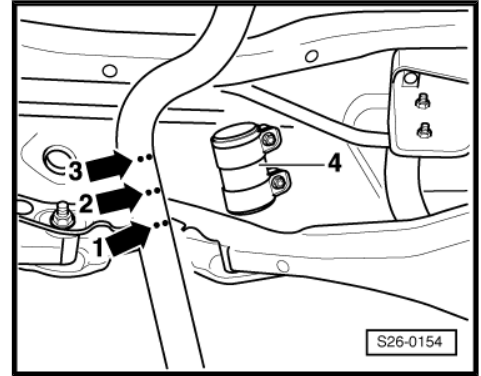


#### WARNING

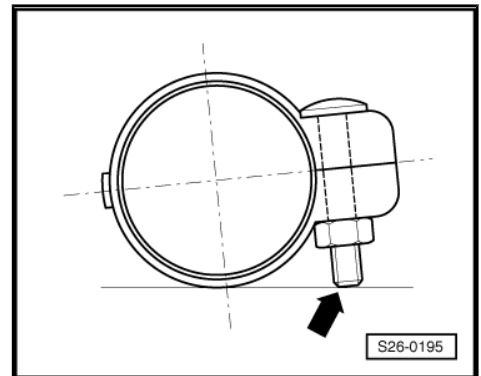
Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted.  
**Wear safety goggles.** ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability  
with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©



- Separate exhaust pipe at right angles at the separation point -arrow 2- with body saw (e.g. -V.A.G 1523 A- ).
- When installing, position double clamp -4- at the side markings -arrow 1- and -arrow 3-.



- Install double clamps in such a way that the ends of the screws do not protrude beyond the bottom edge of the double clamp.
- The bolted connection points to the right.
- Align exhaust system free of stress ➔ [page 195](#) .



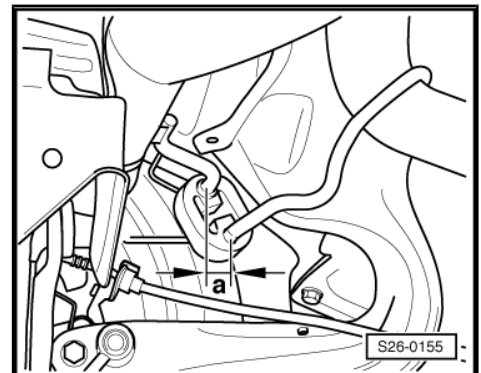
ŠKODA

## 1.8 Aligning exhaust system free of stress

- The exhaust system is aligned when cold.

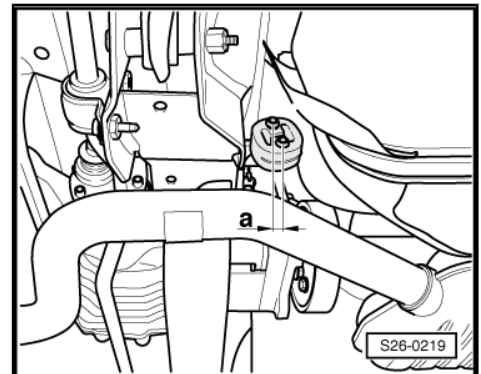
### Vehicles with front-wheel-drive

- Slacken nuts of double clamp ➔ [Item 12 \(page 186\)](#) between front and middle silencer.
- Push the rear silencer so far forward until the dimension -a- = 9 ... 11 mm is achieved between hanger/body and hanger/middle silencer.



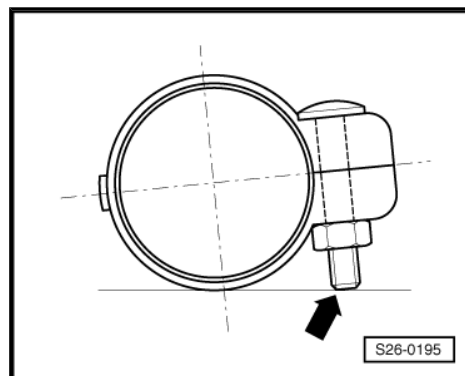
### Four-wheel drive vehicles

- Slacken nuts of double clamp ➔ [Item 5 \(page 188\)](#) between front and rear silencer.
- Push the rear silencer so far forward until the dimension -a- = 7 ... 9 mm is achieved between hanger/body and hanger/rear silencer.

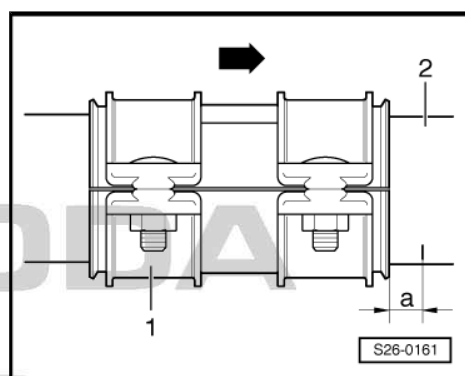


### Continued for all vehicles

- Install double clamps in such a way that the ends of the screws do not protrude beyond the bottom edge of the double clamp.
- The bolted connection points to the right.

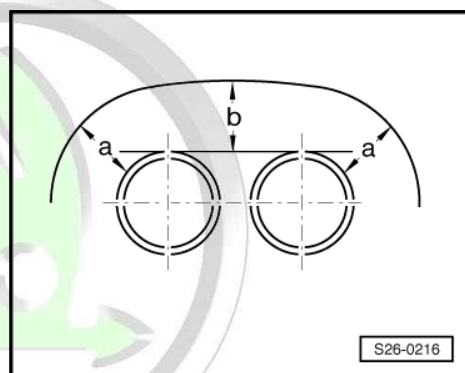


- Push the double clamp -1- to the dimension -a- = 5 mm in front of the marking at the front exhaust pipe -2-.
- Tighten the nuts of the front double clamp evenly to 23 Nm.



### Align tail pipe

- Align rear muffler in such a way that there is an equal distance -a- and -b- between bumper opening and tailpipes.
- For aligning the tailpipes, if necessary loosen hanger on the rear silencer.



## 1.9 Checking the exhaust system for leaks

- Start engine and run in idle.
- Seal off tail pipe of rear silencer for the duration of the leak check (e.g. with cloth or plug).
- Inspect connection points of cylinder head/exhaust manifold, exhaust turbocharger/catalytic converter etc. for leaks by listening.
- Eliminate any leak found.

unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 2 Exhaust gas recirculation system



### Note

- ◆ *The exhaust gas recirculation system is operated by the diesel direct injection system control unit -J248- via the EGR valve - N18- (except engine with engine identification characters BLS) integrated into the valve block to the mechanical exhaust gas recirculation valve.*
- ◆ *The mechanical exhaust gas recirculation valve with cone-shaped valve plunger makes it possible to achieve different opening cross-sections at different valve strokes.*
- ◆ *Any desired valve plunger position is possible as a result of the pulsed operation*
- ◆ *The exhaust gas recirculation switches off at idling speed after about two minutes.*
- ◆ *When taking longer measurements, restart the engine or increase engine speed briefly to more than 1500 rpm. After this repeat the measurement.*
- ◆ *Secure all hose connections with corresponding hose clips.*
- ◆ *Replace self-locking nuts.*

### 2.1 Summary of components of cooling of exhaust gas recirculation system

#### 2.1.1 Summary of components for engine with identification characters BJB

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.®

**1 - Intake manifold**

- ☐ with mechanical exhaust gas recirculation valve and intake manifold flap

**2 - from charge-air cooler****3 - Gasket**

- ☐ replace

**4 - 22 Nm****5 - Exhaust manifold**

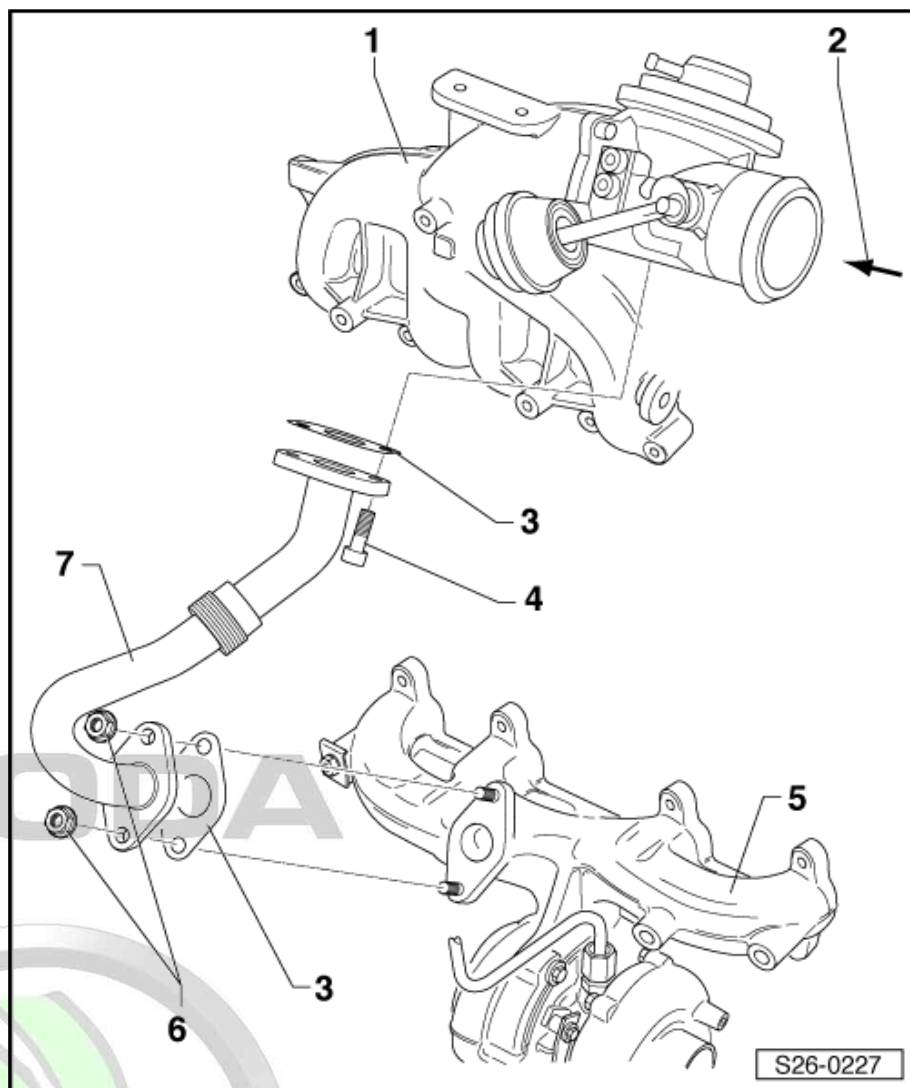
- ☐ with exhaust turbo-charger

**6 - 25 Nm**

- ☐ Coat thread with hot bolt paste -G 052 112 A3-

**7 - Connecting tube**

- ☐ for exhaust gas recirculation



## 2.1.2 Summary of components for engine with identification characters BKC, BXE

1 - 22 Nm

### 2 - Intake manifold

- ☐ with mechanical exhaust gas recirculation valve and intake manifold flap motor -V157-

### 3 - Gasket

- ☐ replace

### 4 - Connecting tube

- ☐ from the radiator flap to the mechanical valve for exhaust gas recirculation

### 5 - Radiator

- ☐ for exhaust gas recirculation

6 - 10 Nm

### 7 - Exhaust manifold

- ☐ with exhaust turbo-charger

8 - 25 Nm

- ☐ Coat thread with hot bolt paste -G 052 112 A3-

### 9 - Connecting tube

- ☐ from exhaust manifold to radiator flap for exhaust gas recirculation

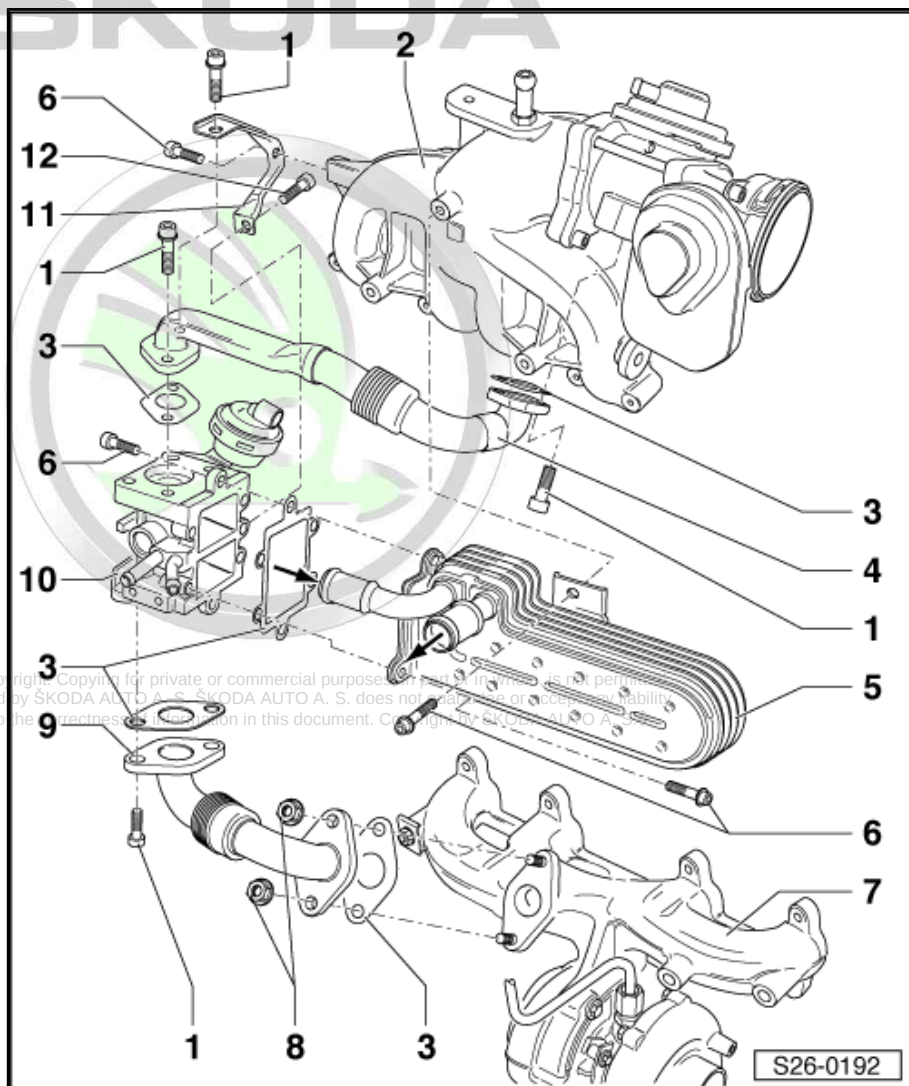
### 10 - Shift flap of radiator

- ☐ when actuating the exhaust gas recirculation radiator change-over valve -N345- the exhaust gases are guided via the radiator

### 11 - Support

- ☐ for shift flap of radiator

12 - 5 Nm





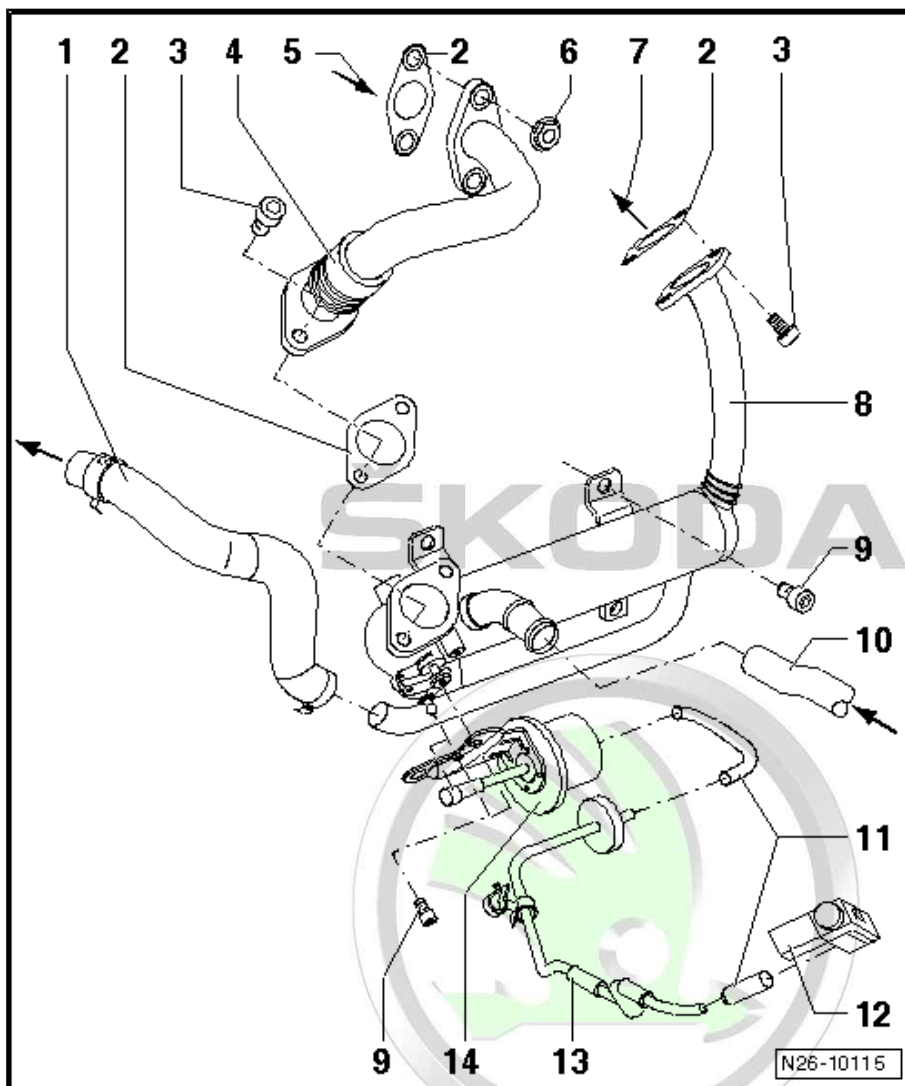
## 2.1.3 Summary of components for engine with identification characters BLS



### Note

The actuation of the exhaust gas recirculation system is performed by the diesel direct injection system control unit -J248- for the EGR valve -N18- with EGR potentiometer -G212- and EGR control motor -V338-.

- 1 - Coolant hose
  - ☐ to connection fitting
  - ☐ connection diagram for coolant hoses  
⇒ [page 103](#)
- 2 - Gasket
  - ☐ replace
- 3 - 22 Nm
- 4 - Connecting tube
- 5 - From exhaust manifold
- 6 - 25 Nm
  - ☐ replace
- 7 - to connection of EGR valve -N18- with EGR potentiometer -G212- and EGR control motor -V338-
- 8 - Radiator
  - ☐ for exhaust gas recirculation
  - ☐ removing and installing  
⇒ [page 200](#)
- 9 - 10 Nm
- 10 - Coolant hose
  - ☐ from the coolant pipe at the rear
  - ☐ connection diagram for coolant hoses  
⇒ [page 103](#)
- 11 - Connecting hose
- 12 - Changeover valve for radiator of exhaust gas recirculation -N345-
- 13 - Connecting tube
- 14 - Vacuum setting element
  - ☐ for bypass flap
  - ☐ must be replaced together with exhaust gas recirculation radiator
  - ☐ Connection diagram ⇒ [page 146](#)



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 2.2 Removing and installing exhaust gas recirculation radiator for engine with engine identification characters BLS

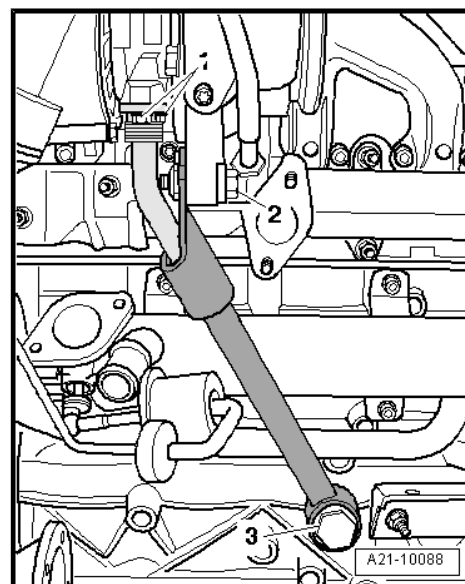
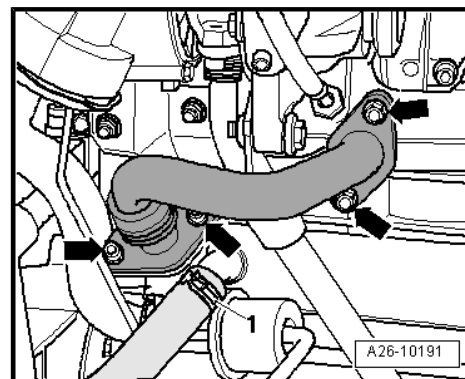
Special tools and workshop equipment required

- ◆ Catch pan , e.g. - VAS 6208-
- ◆ Pliers for spring strap clamps
- Remove the front exhaust pipe with diesel particle filter  
⇒ [page 191](#) .
- Drain coolant ⇒ [page 106](#) .
- Place a catch pan under the engine.
- Detach coolant hoses from exhaust gas recirculation radiator.
- Unscrew connection pipe for exhaust gas recirculation radiator  
-arrows-.

- Release screws -1-, screw -2- and hollow screw -3-.

Protected by copyright. Reproduction or translation without the written permission of SKODA AUTO A. S. SKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S.

- Remove support for exhaust turbocharger with oil return line.



- Unbolt bracket -2- for diesel particle filter.
- Disconnect the vacuum line -1- and remove.
- Release screws -arrows- and remove exhaust gas recirculation radiator.

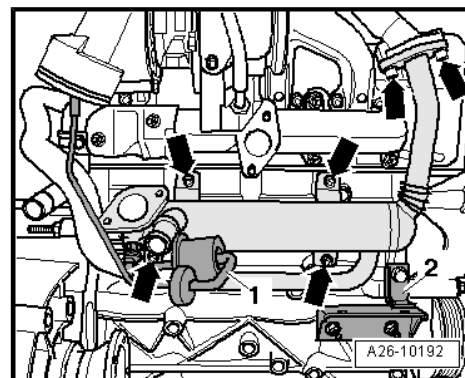
#### Install

- Installation is carried out in the reverse order. Pay attention to the following:



#### Note

- ◆ Replace the gaskets and the self-locking nuts.
- ◆ Secure all hose connections with corresponding hose clips.



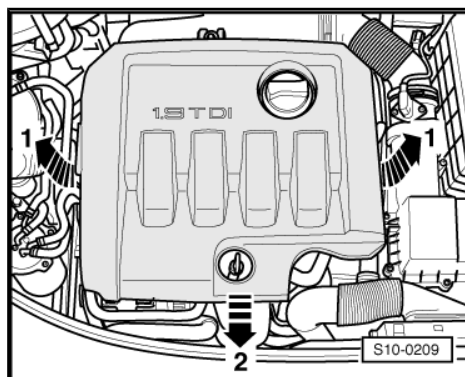
## 2.3 Test mechanical exhaust gas recirculation valve for engine with engine identification characters BJB, BKC, BXE

### Special tools and workshop equipment required

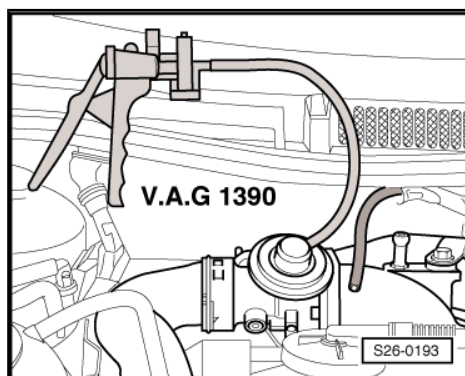
- ◆ Hand vacuum pump with accessories , e.g. -V.A.G 1390- or -VAS 6213-

### Test sequence

- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.
- Disconnect the vacuum hose from the mechanical exhaust gas recirculation valve.



- Connect hand vacuum pump -V.A.G 1390 - or -VAS 6213- to valve and operate.
- Detach hose of hand vacuum pump from mechanical exhaust gas recirculation valve.
- Closing of the valve should be clearly audible.



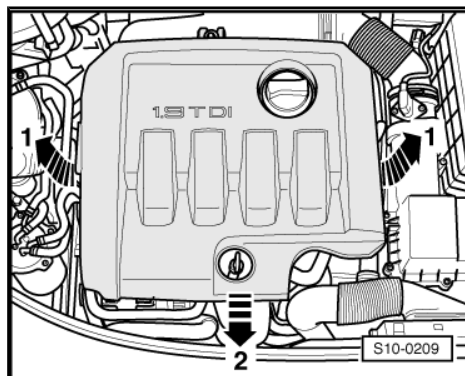
## 2.4 Check shift flap of exhaust gas recirculation radiator for engine with engine identification characters BJB, BKC, BXE

### Special tools and workshop equipment required

- ◆ Hand vacuum pump with accessories , e.g. -V.A.G 1390- or -VAS 6213-

### Test sequence

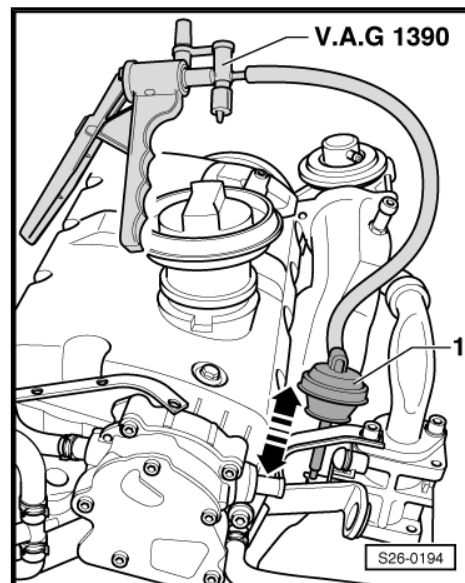
- Lift the engine cover at the sides -arrows 1- and pull out towards the front -arrow 2-.



- Detach vacuum hose from vacuum setting element -1- from shift flap of exhaust gas recirculation radiator.
- Connect hand vacuum pump -V.A.G 1390 - or -VAS 6213- to vacuum setting element and operate.
- The tension rod of the shift flap of the radiator must move -arrow-.

If the tension rod moves with a sudden motion or does not move at all:

- ◆ The vacuum setting element is defective
- ◆ The shift flap jams and is stiff



ŠKODA



Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©

## 28 – Glow Plug System

### 1 Glow Plug System

#### 1.1 Removing and installing metal glow plugs

**Special tools and workshop equipment required**

- ◆ Socket insert ,e.g. -3220-

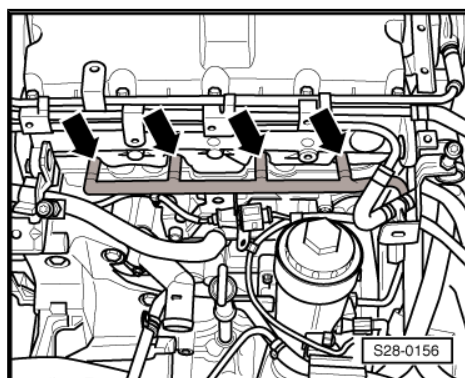
**Removing**

- Switch off ignition.
- Unplug connector of the glow plugs -arrows-.
- Remove glow plugs using socket insert e.g. -3122 B - .

**Install**

Installation is performed in the reverse order, pay attention to the following points:

- Install glow plugs and tighten to 15 Nm.



#### 1.2 Inspecting metal glow plugs

**Special tools and workshop equipment required**

- ◆ Handheld multimeter -V.A.G 1526 B-

**Test conditions**

- Ignition off.

**Test sequence**

- Separate connector of the glow plugs.
- Connect handheld multimeter -V.A.G 1526 B- for resistance measurement between contact and glow plug housing.
- Nominal resistance value: less than 1  $\Omega$

If the nominal resistance value is exceeded (greater than 1  $\Omega$ ), the glow plug is defective.

- Replace defective glow plug ⇒ [page 204](#) .
- Check glow plugs one after the other in all cylinders.
- Re-insert pulled out plugs of glow plugs.

Protected by copyright. Copying for private or commercial purposes, in part or in whole, is not permitted unless authorised by ŠKODA AUTO A. S. ŠKODA AUTO A. S. does not guarantee or accept any liability with respect to the correctness of information in this document. Copyright by ŠKODA AUTO A. S. ©